

A SITE INSPECTION
OF
M&T CHEMICALS SITE
BALTIMORE, MARYLAND

MD-118

FINAL REPORT
AUGUST, 1989
VOLUME I

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1.0 INTRODUCTION

1.1 AUTHORIZATION

The Maryland Department of the Environment, Hazardous and Solid Waste Management Administration (MDE/HSWMA) performed this study under the U.S. Environmental Protection Agency (EPA) Contract No. MD88-0526-0408.

1.2 SCOPE OF WORK

MDE/HSWMA was contracted to perform a Site Inspection (SI) at the subject site. This SI will address past practices and current conditions and offer recommendations at the M&T Chemical site. The purpose of this SI is to determine the existence of contamination present at the M&T Chemicals site and to ascertain if any contaminants have migrated off the site.

This information will be used to determine the site's ranking using the current EPA Hazard Ranking System (HRS). If the site does not meet the criteria needed to be recommended for a Listing Site Inspection (LSI), it will be evaluated for further assessment and possible cleanup under the State Superfund Program.

1.3 EXECUTIVE SUMMARY

The M&T Chemicals site was originally listed on the CERCLIS list from information supplied by M&T under Resource Conservation and Recovery Act (RCRA) as a required notifier. M&T Chemicals has manufactured antimony oxide and blended chrome alloys on the site since the 1960's. This operation replaced a metals recovery operation that was begun in the late 1940's. In 1977 the property was split, M&T Chemicals retained ownership of half of the site while the other half was sold to MRI Corporation. This Site Inspection (SI) addresses the issues at M&T Chemicals but was carried out concurrently with the SI performed on the MRI Corporation site. The MRI Corporation site SI will be addressed in a separate report listed under the CERCLA files as MD-119.

The waste disposal practices of the 1960's included on-site disposal of hexavalent chromium sludge and washwater in unlined lagoons. In 1971 the waste hexavalent chromium generated was reduced to trivalent chromium, but the practice of on-site disposal lagoons was still employed until 1980.

In 1982, the EPA Annapolis Field Office performed a Preliminary Assessment of the M&T Chemical site. Hexavalent chromium, antimony and lead were found in the soils and groundwater on and adjacent to the site. Due to the practices of storing

manufacturing wastes in unlined lagoons, chromium, tin, lead and other metals used in plating would be expected to be found in the soil and groundwater on-site, therefore a medium priority SI was justified.

The SI performed on M&T Chemicals consisted of the installation of four(4) monitoring wells by MDE/HSWMA, these wells were split between MRI Corporation (drilled October 14 & 15, 1988) and M&T Chemicals (drilled October 19 & 21, 1988). Groundwater samples were obtained from these wells along with on-site soil samples and air monitoring for hexavalent chromium on the M&T site.

Samples analyzed from the SI through the Contract Laboratory Program (CLP) indicate the presence of contaminants, particularly heavy metals, in both soil and groundwater samples; but based on the ranking using the current EPA's Hazard Ranking System (HRS), (Appendix D), the score of the M&T site does not meet the criteria needed for recommendation as an LSI. Therefore, the site is recommended for "No Further Remedial Action Planned" (NFRAP) under CERCLA.

2.0 THE SITE

2.1 LOCATION

M&T Chemicals is located in an industrial area of southeast Baltimore City known as Fairfield. The site is located at 1900 Chesapeake Avenue, west of the B&O Railroad tracks, and east of Vera Street. The site can be accessed by taking I-895 south through the Baltimore Harbor Tunnel to exit 12, Frankfurt Avenue. Go right onto Chesapeake Avenue for approximately 1.5 miles, the M&T Chemicals site is on the left hand side of the road (Figure 1). The coordinates for the site are: $39^{\circ} 14' 32''$ N and $76^{\circ} 34' 38''$ W.

2.2 SITE LAYOUT

The current M&T property is a north-south elongated rectangle of approximately three (3) acres. Company offices and manufacturing facilities take up the southern half of the site. Antimony sulfide slag was stored in an unenclosed pit north of the manufacturing buildings (Figure 2). Hexavalent chromium waste water and trivalent chromium oxide (1971-1980) were stored in open unlined storage ponds in the northern half of the site. A driveway runs along the eastern border of the site from Chesapeake Avenue to the rear of the manufacturing buildings.

The Baltimore & Ohio Railroad is located north of the site. The northern border of the site is bounded by an unkept vacant lot

overgrown with weeds. A railroad siding overgrown with weeds bounds the site to the east. The site is located approximately 1500 feet west of the Patapsco River. The M&T Chemicals property and surrounding area is flat lying. Much of the area surrounding the site is paved.

2.3 OWNERSHIP HISTORY

In 1977, M&T Chemicals' parent company, American Can Company, sold M&T Chemicals to Elf Aquitaine of France, but retained one division. M&T Chemicals site in Baltimore was split into two properties: M&T Chemicals owned by Elf Aquitaine and MRI Corporation owned by American Can Company. The production operations were split between the two companies.

2.4 SITE USE HISTORY

The following information was obtained from the M&T Chemicals' (MD-118) CERCLA Pre-Remedial files.

M&T Chemicals started a metals recovery operation on the site in the late 1940's. The metals recovery operation involved the salvaging of plated metals.

In the 1960's, the plant began the manufacturing of antimony oxide, and blended chrome alloys. Hexavalent chromium sludge and wash water was disposed of on-site in unlined lagoons and possibly

buried in steel drums. In 1971, the plant began treating all hexavalent chromium waste products and reduced them to trivalent chromium oxide sludge. M&T Chemicals continued to dispose of the treated sludge in unlined lagoons until 1980.

In 1977, M&T Chemicals split into two properties, M&T Chemicals and MRI corporation. Waste from the M&T Chemicals operation existed on both properties at the time of the division.

In a letter (dated June 30, 1977) from M&T Chemicals Inc. to the Department of Natural Resources Water Resources Administration (DNR/WRA) Industrial & Hazardous Substance Section, it stated that three (3) separate wastes produced in the manufacturing process were potential hazardous substances in addition to the chromium waste mentioned previously. (1) Antimony sulfide slag from the Antimony Oxide Manufacturing Process. The slag was stored outdoors until an enclosure was built in 1980. When a large enough volume of slag was collected it was sold to an antimony smelting operation. The lead content of the slag ranges from 0.4 to 1%. (2) Alkaline waste water was also generated by the antimony processes. The water has a pH of 14 and was sold to MRI Corporation to be used in their detinning operation. (3) Aluminum hydrate sludge was produced when the alkaline waste water was neutralized. Trace amounts of heavy metals were included in this sludge.

Currently M&T Chemicals manufactures antimony oxide, and blended chrome alloys. MRI Corporation ceased operations in 1982. The waste stream (generated by M&T Chemicals) which was previously sold to MRI is now disposed of at off-site approved licensed facilities for hazardous or industrial waste disposal.

2.5 PERMIT AND REGULATORY ACTION HISTORY

In May 1979, DNR/WRA issued a Facility Permit to M&T Chemicals. The Designated Hazardous Substance (DHS) Permit No. A037, authorized the treatment of Antimony Sulfide Slag, Chromium Oxide, and Alkaline Wastewater. The permit required M&T to cease the use of the Chromium Oxide lagoons and complete a renovation of the lagoon system by June 1980. The lagoons were replaced by a holding and filtration system. The dewatered sludge was disposed of at off-site approved facilities. Also a monitoring well system was required, to be completed by September 1979.

A State National Pollutant Discharge Elimination System (NPDES) permit no. 80-DP-0094 issued to M&T Chemicals in 1980 was modified for the additional wastewater generated because of the lagoon renovation.

A new State National Pollutant Discharge Elimination System (NPDES) permit 87-DP-0094 was issued to M&T Chemicals in 1987 by the Office of Environmental Programs, Department of Health and Mental Hygiene (DHMH). This permit authorized the discharge of

effluent into four storm sewer drains at the site. The NPDES permit for the site requires periodic testing of the discharged effluent.

There has been no regulatory action taken on the site to date.

2.6 REMEDIAL ACTION TAKEN TO DATE

In 1980, a Resource Conservation and Recovery Act (RCRA) DHS permit renewal for treatment and storage of hazardous waste required M&T Chemicals to remove the chromium sludge from the lagoon area and to dispose of it at an approved facility. M&T Chemicals was also required to dispose of chromium wastes off-site and store antimony slag in an enclosed storage area. Also under this permit a monitoring well system was installed on the MRI Corporation property. M&T chemicals complied with the 1980 permit requirements.

The NPDES permit required periodic testing of effluent discharge on-site, but does not require testing of soils or groundwater.

In October 1988, Four (4) monitoring wells were installed by MDE/HSWMA (Figure 2). Two were installed on the M&T site and two on the MRI site. These wells were installed one month prior to the SI performed by MDE/HSWMA.

3.0 ENVIRONMENTAL SETTING

3.1 WATER SUPPLY

Most of the residents in the area surrounding the M&T site, within a three (3) mile radius, receive their water from a municipal water supply, there are only two domestic wells approximately two (2) miles from the site. These wells are located upgradient from the site and are screened in the deeper aquifer, located in the Patapsco Formation.

3.2 SURFACE WATER

The site is approximately 1500 feet from the Patapsco River. Surface waters from the site and surrounding areas will enter the Patapsco River (Figure 3). The Curtis Bay is approximately one (1) mile from the site. Surface water may enter the Patapsco River via the Curtis Bay. The facility is very flat lying with a slope less than 3%. The slope towards the Patapsco River is approximately 2%. Heavy metal contamination of the local food chain is possible. The Patapsco River and the adjoining Chesapeake Bay are important sources of seafood for the State of Maryland. The Curtis Bay and the Patapsco River are used for recreational purposes. There are no downstream surface water intakes within three (3) miles of the site.

3.3 HYDROGEOLOGY

3.3.1 GEOLOGY

The site is located in the City of Baltimore, near Fairfield, Maryland. It is in the Coastal Plain Physiographical Province, just east of the fall line. The area is characterized by relatively flat lying ground with topographic reliefs of approximately 60 feet to the west due to granitic intrusions. To the east, the topographic relief is approximately 30 feet because of less resistant Coastal Plain sediments. The occurrence of the Belair Belt to the west marks the Fall Line between the Coastal Plain Province and the Piedmont Province.

Among the lithologies that are observed at the site is the quaternary silt clay facies of the Talbot Formation (Figure 4). It is characterized by orange, poorly sorted and bedded quartz silts with kaolinite, illite, and montmorillonite clays. Underlying this are the lower cretaceous clay facies and sand facies, the Patapsco Formation of the Potomac Group. The clay facies consist of red-yellow and brown mottled kaolinitic clays which contain interbeds of quartz sand and silt and is believed to be 0.5 - 50 meters thick. The sand facies of the Patapsco Formation is believed to be 0.5 - 30 meters thick. It consists of well-sorted medium to fine grained quartz sand. Beneath this lies the lower cretaceous clay facies of the Arundel Formation, also part of the Potomac Group. It is believed to be 0.5 - 10 meters

thick and is characterized by grey, brown, black, and red kaolintic and illitic clays with quartz silt. Underlying this formation lies the sand facies of the Patuxent Formation which consists of intercalated sand, gravel, silt, and clay with hematite-limonite cements. It is believed to be 0.5 - 35 meters thick and of the lower Cretaceous Period (Figure 5; Geologic Map of Baltimore County and City, 1976).

3.3.2 GROUNDWATER

Surface water runoff within a three (3) mile radius of the site have the opportunity to percolate into the silt-clay facies of the Talbot Formation. Percolation occurs by direct seepage into the soils and underlying facies.

The surface pathways of runoff in the site area are generally to the northeast. Most of the water which does not percolate, evaporate, or enter storm drainage lines, will enter the Patapsco River. To the west of the site, at the Fall Line, several fractures trace along the contact with the sedimentary rocks and the intrusive members. These fractures allow for rapid transmission of water.

Within a three (3) mile radius of the site, there are two(2) domestic wells drilled since 1969 (MDE, Division of Residential Sanitation. 1989).

The most exploited aquifer in the area is the sand facies of the Patapsco Formation. Well depths vary from 40 to 230 feet with yields ranging from 7 to 10 gallons per minute (gpm). Good production however, is only assured if the sand/gravel facies of the Patapsco Formation is tapped. These wells are used for drainage and non-commercial purposes. The two residential wells are located approximately two (2) miles southwest and approximately three (3) miles southeast of the site. Since the local strata dips to the east, it is reasonable to assume that groundwater migrates to the east.

Hydraulic conductivity is defined as "the capacity of a porous medium to transmit water", and it is measured in terms of gallons per day per square feet or cm/sec. The hydraulic conductivity of the most exploited aquifer in the area is assumed to range between 10^{-3} and 10^{-4} cm/sec (Groundwater, Freeze and Cherry, 1979). Transmissivity, the ability to transmit water over the entire thickness of the aquifer, values range from 160 to 6700 square feet per day (The Quantity and Natural Quality of Groundwater in Maryland, Maryland Department of Natural Resources, 1987).

3.3.3 SOILS

The site rests, geologically, on the silt-clay facies of the Talbot Formation. At this location it exhibits a 0-5% slope, however, most of the area is covered with concrete and asphalt due to construction. Underlying this, also due to construction, is

artificial fill. To the west, within a three (3) mile radius, lies the City of Baltimore, another area of asphalt and concrete cover. The main soil types to the east, across the Patapsco River are the Sassafras-Croom-Chillum Association. This soil association consists of gently sloping to steep, well drained, loamy soils with compact, gravelly subsoils in places. (Soil Survey of Anne Arundel County, Maryland, 1973).

3.5 CLIMATE

The site is approximately fifteen (15) feet above sea level. Normal precipitation, measured over thirty (30) year period, is 41.04 inches per year. Although rainfall measured 41.00 inches and 32.30 inches in 1987 and 1988, respectively. Average temperature, measured over the same period is 55.1 degrees Fahrenheit. These values are obtained from John Stiller of the University of Maryland's State Climatology Office, and were taken by the BWI measuring station. The climate is influenced by yearly fluctuations of the jet stream patterns and daily fluctuations of wind patterns over the Chesapeake Bay.

The net precipitation in the area is 5.84 inches per year. The 1-year/24-hour rainfall is 2.5 inches.

3.6 LAND USE

M&T Chemicals is currently an active manufacturer of antimony oxide and blended chrome alloys. MRI Corporation has ceased their operations and is being used as an automobile storage facility. The site is located in an industrial area of southeast Baltimore City. The Patapsco River lies across Chesapeake Avenue east of the site. A dock and storage facility for Conoco Oil lies approximately 150 yards southeast of the site. An automobile storage lot now occupies the MRI Corporation property adjacent to the site to the west. An asphalt paving company parks vehicles on the western edge of the automobile storage lot on Vera Street. Buffalo Tank Division of Bethlehem Steel is located approximately 1500 feet north of M&T Chemicals on Frankfurt Avenue. Curtis Bay lies about one (1) mile from the site on the other side of Chevron Refinery.

3.7 POPULATION DISTRIBUTION

There are approximately 29,000 residence within a three (3) mile radius of the M&T site, using the 1980 Census Tract.

3.8 SENSITIVE ENVIRONMENTS

According to the Department of the Environment, Water Pollution title 26, subtitle 08, Chapter 02, Water Quality pages 479-493, the Curtis Bay and the Patapsco River are Class II waters.

Class II waters are classified as Shellfish harvesting waters. According to COMAR 26.08.02.01B(3) (d), this classification includes waters where:

(i) Shellfish are propagated, stored, or gathered for marketing purposes; and

(ii) Actual or potential areas for harvesting of oysters, softshell clams, hardshell clams, and brackish water clams.

Intertidal wetlands, greater than five(5) acres are located within 1500 feet of the site.

4.0 WASTE TYPE AND QUANTITIES

The following information was obtained from the PA performed in 1982, by the EPA Annapolis Field Office. The PA can be found in the CERCLA Pre-Remedial files listed under MD-118.

In 1982, the EPA Annapolis Field Office performed a PA of the M&T Chemicals site. During the PA, a soil sample was taken from the cleaned-up chromium sludge lagoon and a groundwater sample was taken from a monitoring well installed earlier on the MRI property adjacent to M&T Chemicals. Test results from the soil sample detected high levels of tin, barium, chromium, and lead. The monitoring well detected tin, chromium, lead and nickel in high amounts. Until 1971, hexavalent chromium wastewater was disposed

B-1000
(10)

of on-site in unlined lagoons. Trivalent chromium waste was disposed of into the lagoons until 1980.

M&T Chemicals now produces approximately 35,000 gallons/month of chromium oxide, 250,000 lbs/month of antimony sulfide slag, and 63,000 gallons/month of alkaline waste water and disposes the wastes off-site at approved licensed facilities for hazardous or industrial waste disposal.

5.0 FIELD TRIP REPORT

5.1 SUMMARY

The Maryland Department of the Environment Hazardous and Solid Waste Management Administration conducted two site visits on November 16, 1988 and November 17, 1988 for the purpose of performing a SI at the M&T Chemicals site. The weather on both days was overcast but clearing with the temperatures approximately 70° Fahrenheit. For the SI two(2) monitoring wells were installed in October 1988, on the site. Groundwater samples were obtained from these wells. Also soil samples were obtained on and adjacent to the former lagoon areas. Nine (9) soil samples were collected from the M&T Chemicals site (Figure 6).

Samples were collected and shipped according to procedures outlined in the State of Maryland Quality Assurance Project Plan for Site Inspections. Samples were analyzed utilizing the EPA

Contract Laboratory Program (CLP). Well water was analyzed for Routine Analytical Services (RAS) organic and inorganic pollutants. Soil samples and sediment samples were analyzed for RAS inorganic pollutants. Soil sample collected at the former lagoon, (SS5), was also sent for RAS organic pollutant analysis in addition to the inorganic analysis. EP toxicity was performed on soil samples that exceeded the following parameters: lead 5 ppm, silver 5 ppm, arsenic 5 ppm, barium 100 ppm, chromium 5 ppb, cadmium 1 ppm, mercury 0.2 ppm, and selenium 1 ppm and the sample was submitted with a Special Analytical Services (SAS) request.

On February 27, 1989, air monitoring was conducted at M&T Chemicals by MDE's Air Management Administration (MDE/AMA). Air sampling filters were analyzed for hexavalent chromium, RCRA Method 7196, and submitted with a SAS request for chromium analysis. The weather was cloudy and windy. The temperature was 37⁰ Fahrenheit. It had rained on the previous day of the air monitoring event. Consequently, the ground had become saturated, therefore the conditions for air monitoring were poor.

5.2 PERSONS CONTACTED

5.2.1 PRIOR TO FIELD TRIP

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5.2.2 AT THE SITE

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M&T Chemicals, Inc.
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5.4 SITE OBSERVATIONS

- The M&T facility is still in operations. A parking lot for the facility occupies the front part of the site.
- A dirt driveway parallels the old railroad tracks that leads to the former lagoon area behind the M&T main office building.
- The site is enclosed by a fence.
- The former lagoon area is covered sparsely with grasses.
- No HNu photoionization detector readings were recorded above background during the SI.
- Two monitoring wells were installed on the M&T Chemicals site, MW-1 on the eastern edge of the site and MW-2 on the northwestern corner of the site.
- Two soil samples, SS1 and SS2, were taken from the northern border. SS1 was taken on the right hand side of the road by the railroad tracks in a small depression. SS2 was taken from an area opposite the loading bays where hexavalent chromium was observed on the ground.

- Soil samples SS3 and SS4 were taken from the area of the chromium sludge lagoons.
- Soil samples SS5 & SS6 were taken in an area west and north of the chromium sludge lagoon.
- Soil sample SS8 is a background sample.
- Soil sample SS9 was taken in the proximity of the alkaline wastewater tank.
- Soil sample SS10 was taken in the area where the antimony sulfide slag was stored on the open ground.
- Air monitoring was conducted but the ground had become saturated from rainfall, therefore there was no apparent dust blowing on the site. Because of technical problems with the air monitoring equipment, air monitoring was only conducted for fourteen(14) hours instead of twenty four(24) hours that was required in the RCRA protocol.

6.0 TOXICOLOGICAL EVALUATION

6.1 INTRODUCTION

During the M&T Chemicals SI a total of nine(9) soil borings and three (3) water samples were taken and analyzed for inorganic

metals, cyanide, volatile organics (VOC's), semi-volatile organics (BNA's), and pesticides/PCB's. The analytes that were successfully analyzed through the Contract Laboratory Program (CLP) Routine Analytical Services (RAS) will be used in toxicological evaluation as well as determining the contamination present on-site.

Data analyzed through the CLP laboratory, was reviewed for quality assurance by the U.S. EPA contractor, Weston. Results of the review can be found in Appendix E of this report. Some of the data analyzed were given qualifiers by Weston because of the questionable quality of the results.

The groundwater samples MW-1, MW-2, MW-3, and MW-4 analyzed for the inorganic metal, cadmium, were reviewed by Weston, and given the qualifier of "B" (Appendix E). "B" indicates that the sample may have been contaminated either in the field while sampling, or in the laboratory during the analysis. Because the field blank, MW-4, contained cadmium in concentrations as high as the samples from the monitoring wells sampled on-site, this data can not be used in the evaluation of the contamination present at the site, nor can it be used in the toxicological evaluation.

The samples MW-1, MW-2, MW-3, MW-4, SS-11, and SS-4 analyzed for the organic contaminants, Methylene Chloride and Acetone, were reviewed by Weston, and were also given the qualifier of "B" (Appendix E). These contaminants are common laboratory contaminants, therefore they will not be used in the evaluation of

the contamination present at the site nor will they be used in the toxicological evaluation. In addition to the above mentioned contaminants, many of the Polynuclear Aromatic Hydrocarbons (PAH's) analyzed for MW-3 were given the qualifier of "R" (Appendix E). Although these contaminants were not detected in the sample, the qualifier suggests that they may be present in trace amounts.

The contaminants successfully analyzed and revealed in the CLP data included heavy metals and volatile organic compounds. The main contaminants of toxicological concern are the heavy metals, (chromium and lead), and the Polynuclear Aromatic Hydrocarbons (PAH's). The heavy metals were found in concentrations that exceeded the U.S. EPA's Maximum Contaminant Level (MCL) in some of the samples taken on-site.

6.2 ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

6.2.1 GROUNDWATER

Two (2) monitoring wells were sampled on the M&T Chemicals site during the SI. Inorganic metals (chromium, and lead) were found in concentrations that exceeded the U.S. EPA's MCL (Table 1). In both the monitoring wells lead exceeded the U.S. EPA's drinking water standard of 5.0 ug/l. (U.S. EPA Drinking Water Standards and Health Advisories, 1988).

There were no organic contaminants of any toxicological concern found in the monitoring wells on the M&T Chemicals site (Table 1).

6.2.2 SOIL

Nine (9) soil samples were taken during the SI. Elevated concentrations of arsenic, chromium and lead were found in on-site soil samples. In addition to the inorganic metals elevated concentrations of Polynuclear Aromatic Hydrocarbons (PAH's) were also found in on-site soil samples.

6.3 POTENTIAL ENVIRONMENTAL AND HUMAN EXPOSURE PATHWAYS

Potential environmental pathways include those related to human exposure to contaminated soil, surface water, groundwater and the food chain. Potential human exposure to contaminants include direct contact with, and inhalation of contaminated soil, and surface water by workers at the site or unauthorized persons trespassing onto contaminated areas. The site is closed off by a fenced, therefore, there is no threat of exposure to children or other persons in the vicinity of the site. There is a potential for equipment and workmen working on-site to pick up contaminated soil on tires and boots, further spreading the contaminated soil.

A possibility exists for surface water to pick up contaminants and transport them off-site. The Patapsco River is approximately

1500 feet from the site, therefore, contaminants can enter the Chesapeake Bay via the Patapsco River. The possibility exists for the contaminants found on-site to degrade the water quality for aquatic life in the Bay system. Some of the contaminants, particularly the heavy metals and the Polynuclear Aromatic Hydrocarbons (PAH's), can be persistent in the environment and concentrate in the food chain. The threat exists for people consuming seafood from the tributaries and rivers receiving runoff from the site.

6.4 HEALTH EFFECTS OF CONTAMINANTS FOUND

6.4.1 POLYNUCLEAR AROMATIC HYDROCARBONS (PAH's)

Most of the PAH's found on-site were associated with the soils on the site. The PAH's are considered to be a hazardous waste and a priority toxic pollutant by the U.S. EPA. A drinking water standard has been set not to exceed 0.2 ug/l, but for the protection of human health the levels should preferably be zero. Certain PAH's have been demonstrated as carcinogens in test animals at relatively high exposure levels. Benzol(a)pyrene is a known carcinogen. (Pesticide Manufacturing and Toxic Materials Control Encyclopedia, 1980).

6.4.2 CHROMIUM

Chromium was found in both on-site soils and in the monitoring wells (Figure 7). Chromium is considered to be a hazardous waste constituent and a priority toxic pollutant by the U.S. EPA. Chromium compounds act as allergens which cause dermatitis to exposed skin. They may also produce pulmonary sensitization. (Handbook of Toxic and Hazardous Chemicals and Carcinogens, 1985).

6.4.3 LEAD

Elevated lead concentrations were found in on-site soil and groundwater samples (Figure 8). Lead is considered to be a hazardous substance and a priority toxic pollutant by the U.S. EPA. The early effects of lead poisoning are non-specific. The peripheral nerve affected most frequently is the radial nerve. This will occur only with exposure over an extended period of time and causes "wrist drop". Recovery is slow and not always complete. When the central nervous system is affected, it is usually due to ingestion or inhalation of large amounts of lead. This results in severe headaches, convulsions, coma, delirium and possible death. The kidneys can also be damaged after long periods of exposure of lead, with loss of kidney function and progressive azotemia. (Handbook of Toxic and Hazardous Chemicals and Carcinogens, 1985).

6.5 EVALUATION

The contaminants found on-site are located on the facility. Site soils in these areas are contaminated with heavy metals and PAH's. Individuals coming in direct contact with contaminated soils will be at direct risk of exposure. The site is secured by a fence, so the concern for those individuals who would be exposed to the metals via dermal contact, inhalation, and ingestion of contaminated soils is minimized. Soil contaminants picked up by surface water will enter the Patapsco River, which is part of the Chesapeake Bay system, further degrading the water quality for aquatic life.

There are only two (2) residential wells, located upgradient and screened in the deeper aquifer, within a three (3) mile radius of the site. Due to the fact that shallow groundwater flows directly into the Patapsco River, the possibility of contaminants from the site to migrate into the deeper aquifer of concern is limited. There are no other industrial or residential uses of the groundwater. Therefore, contamination to the aquifer on-site does not represent a current health concern.

Based on the evaluation of the site at this time, the site is considered to be a low potential public health concern. In the future, if residents move into the vicinity of the site, or if the groundwater in the area is used, the site should be evaluated for remediation. Currently no remediation is planned. However, the

site represents a potential threat to marine life in the Bay system, since leachate for on-site soils can contain heavy metals as well as other contaminants.

7.0 CONCLUSIONS AND RECOMMENDATIONS

On November 16 and 17, 1988 MDE/HSWMA conducted a SI of the M&T Chemical site. Samples taken on-site were analyzed according to the Contract laboratory Program (CLP). Results of these samples indicate contamination to both the soil and groundwater on-site. The main contaminants of concern include, chromium, lead and PAH's. However, there are no drinking or domestic uses of the groundwater in the vicinity of the site. Based on the current HRS, the score of the site does not meet the criteria for it to be recommended for a Listing Site Inspection (LSI). Therefore, the site is recommended for "No Further Remedial Action Planned" (NFRAP) under CERCLA.

8.0 REFERENCES

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8. Sittig, Marshall. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 1985.

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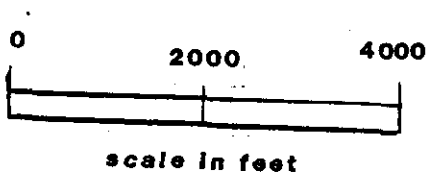
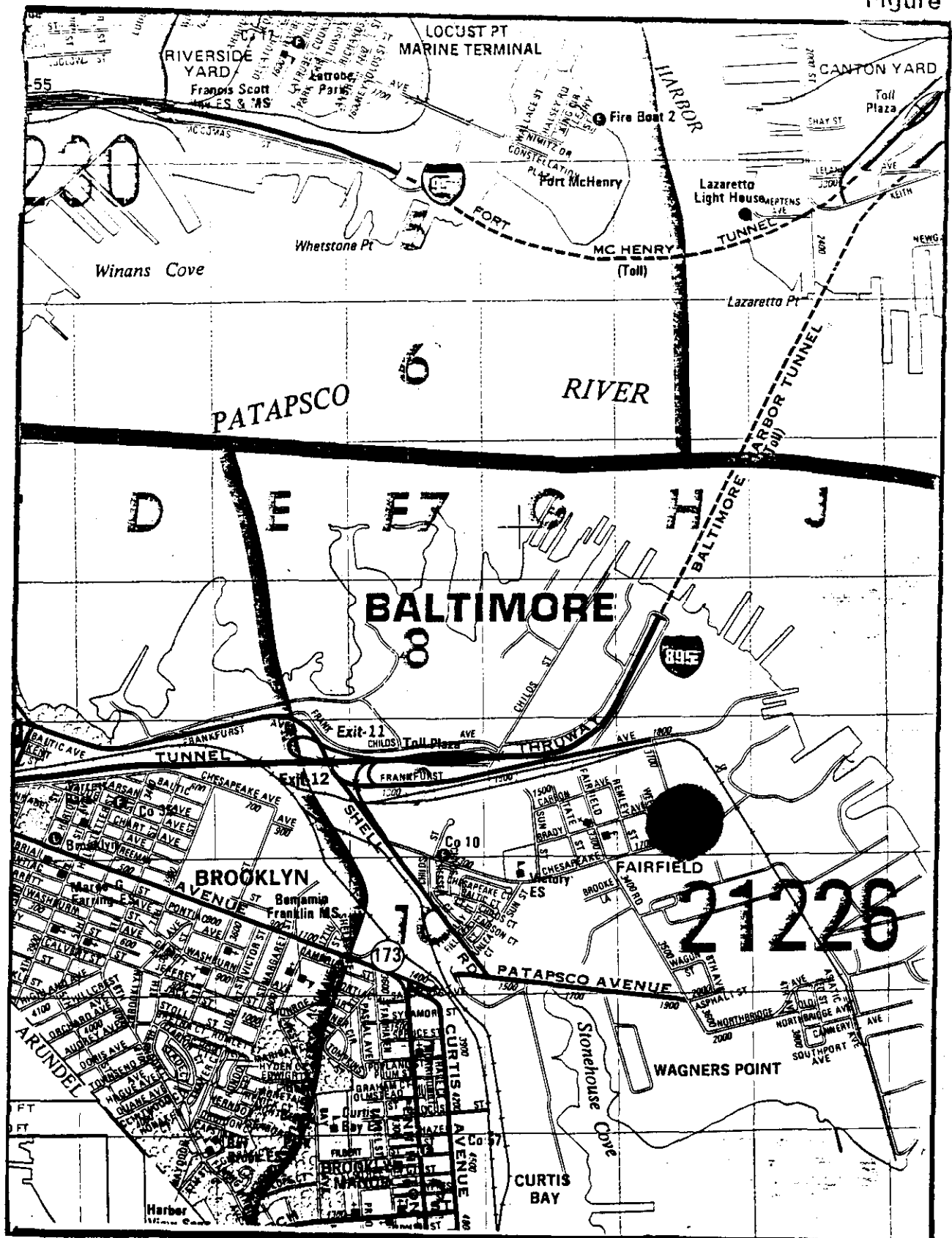
12. U.S. EPA: Health Advisory for Cadmium, Office of Drinking Water, Washington, D.C., 1985.

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APPENDIX A
SITE MAPS AND FIGURES

M&T CHEMICALS' STREET MAP

Figure 1



ADC Publication

Permit Use No. 30588011

M&T CHEMICALS SITE MAP

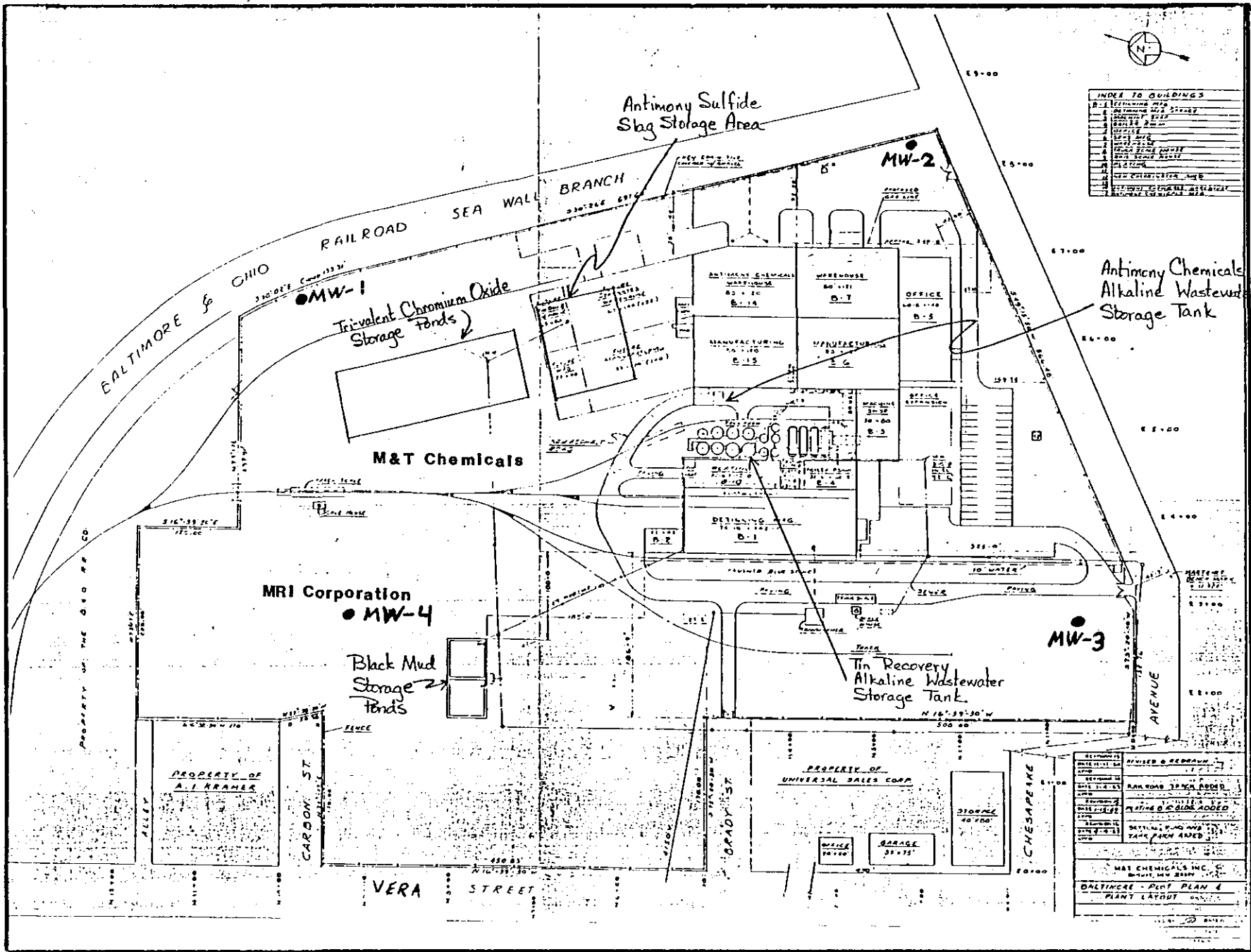
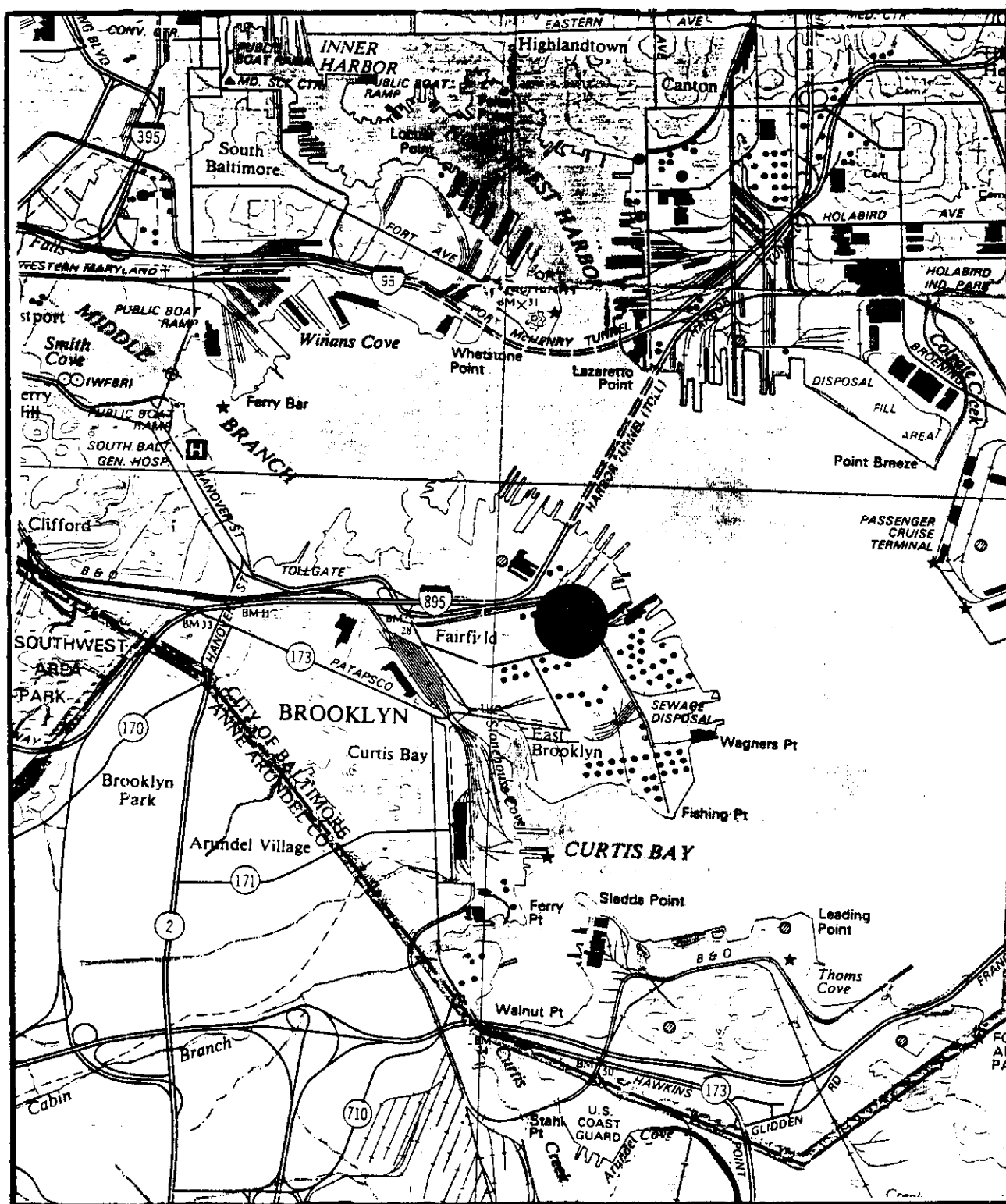


Figure 2

not to scale

TOPOGRAPHIC MAP OF M&T CHEMICAL SITE

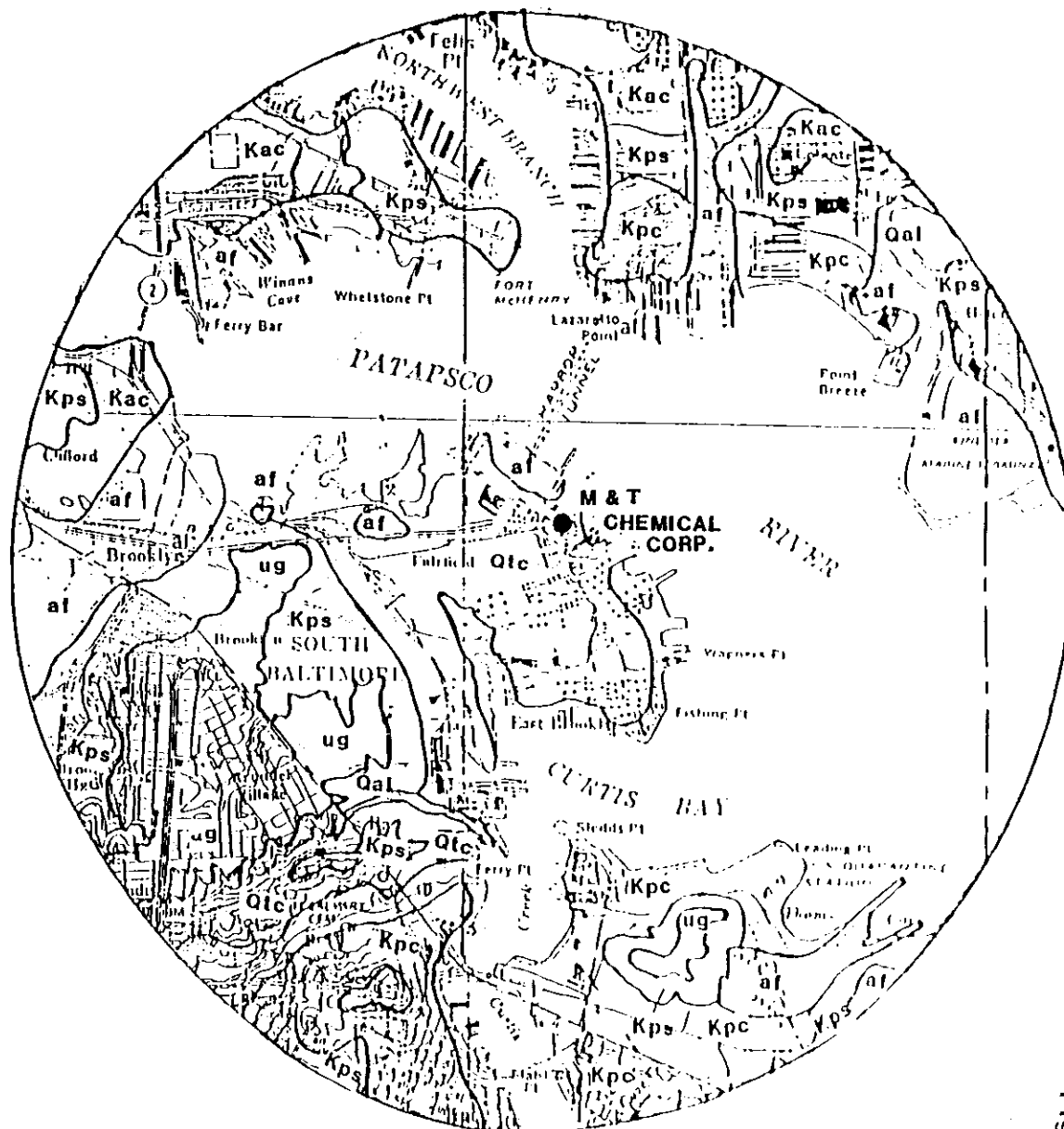
FIGURE 3



U.S.G.S. Map Revised, 1985

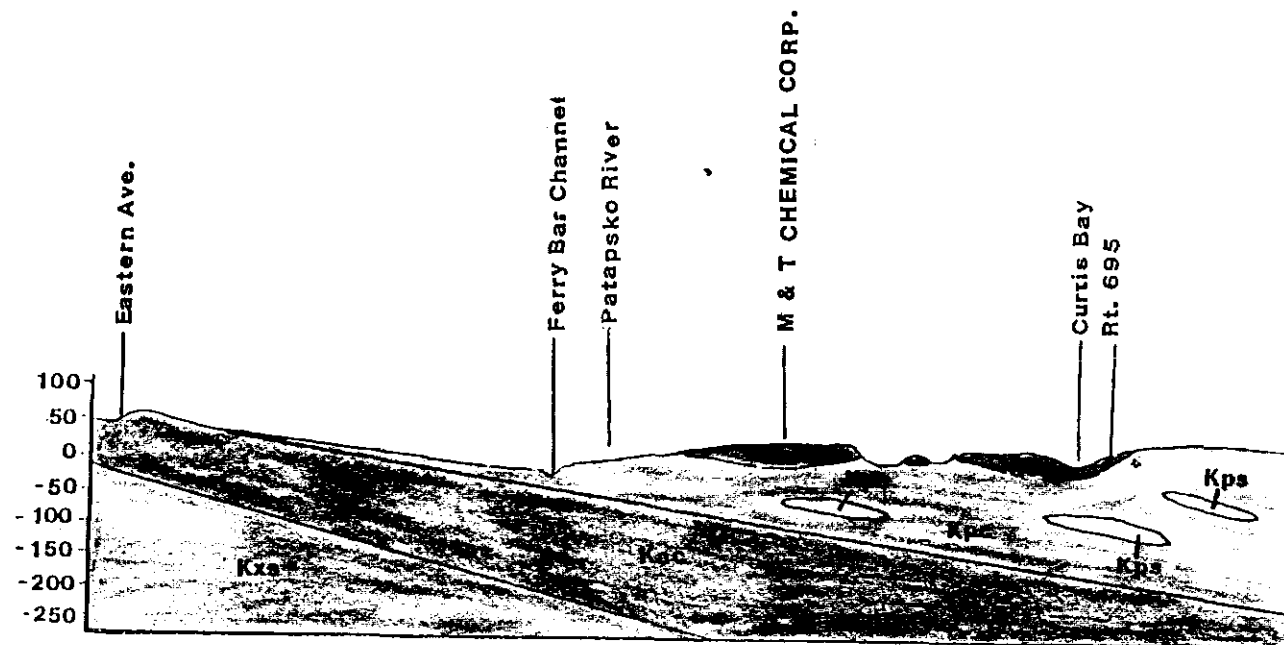
GEOLOGIC MAP OF M & T CHEMICAL CORP., BALTIMORE, MARYLAND

- af - Artificial Fill
- Qal - Alluvium
- Qtc - Talbot Formation
Silt-clay facies
- ug - Upland Gravel
- Kpc - Patapsco Formation
Clay facies
- Kps - Patapsco Formation
Sand facies
- Kac - Arundel Formation
Clay facies








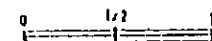
1/2
Scale in miles

Figure 4



GEOLOGIC CROSS-SECTION THROUGH M & T CHEMICAL CORP.

- | | |
|---|--|
|  | Qlc - Talbot Formation
Silt-clay facies |
|  | Kpc - Patapsco Formation
Clay facies |
|  | Kps - Patapsco Formation
Sand facies |
|  | Kac - Arundel Formation
Clay facies |
|  | Kxs - Patuxent Formation
Sand facies |



Scale in miles

M&T CHEMICALS' SAMPLING POINTS

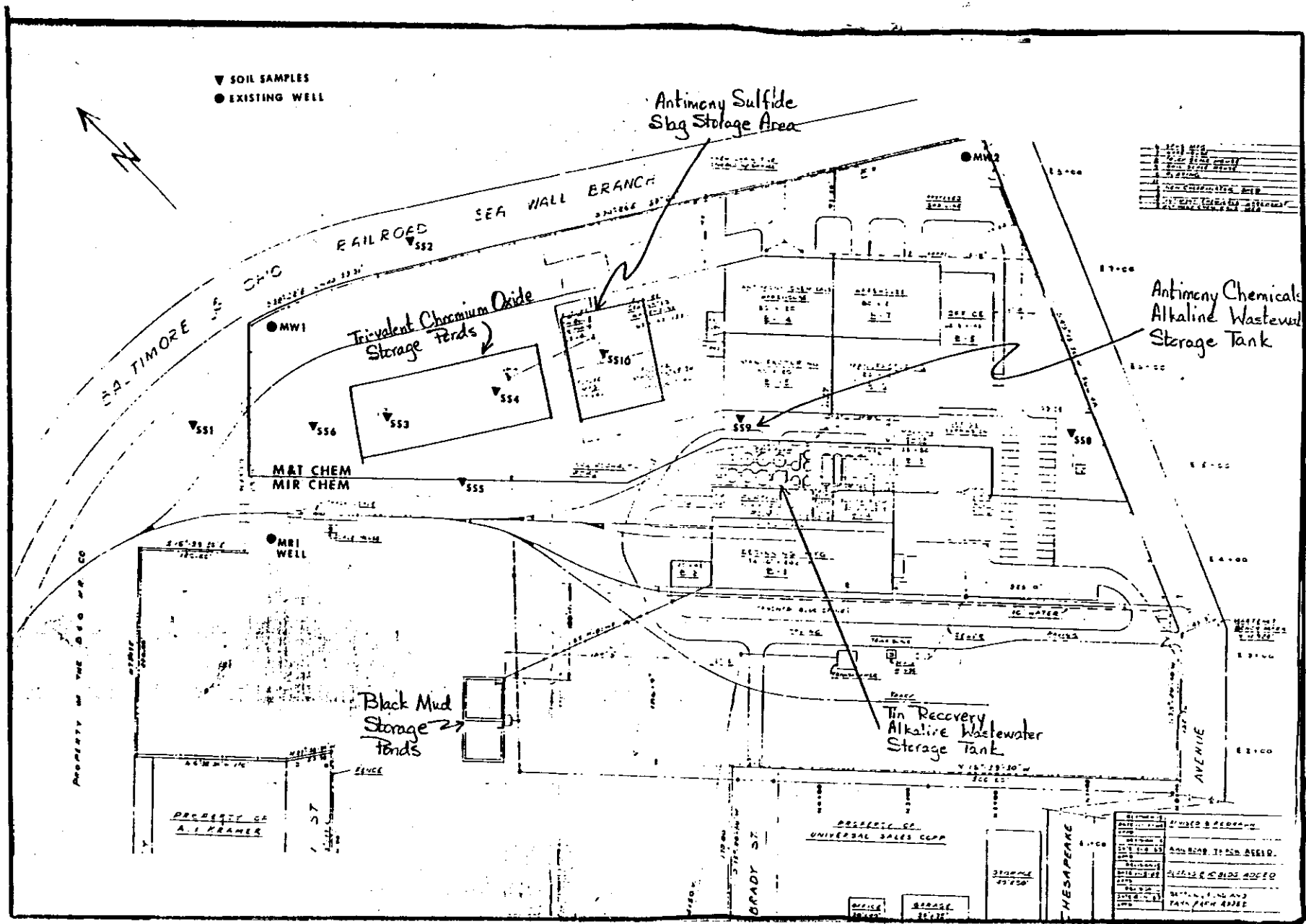


Figure 6

M&T CHEMICALS' CHROMIUM CONTAMINATION

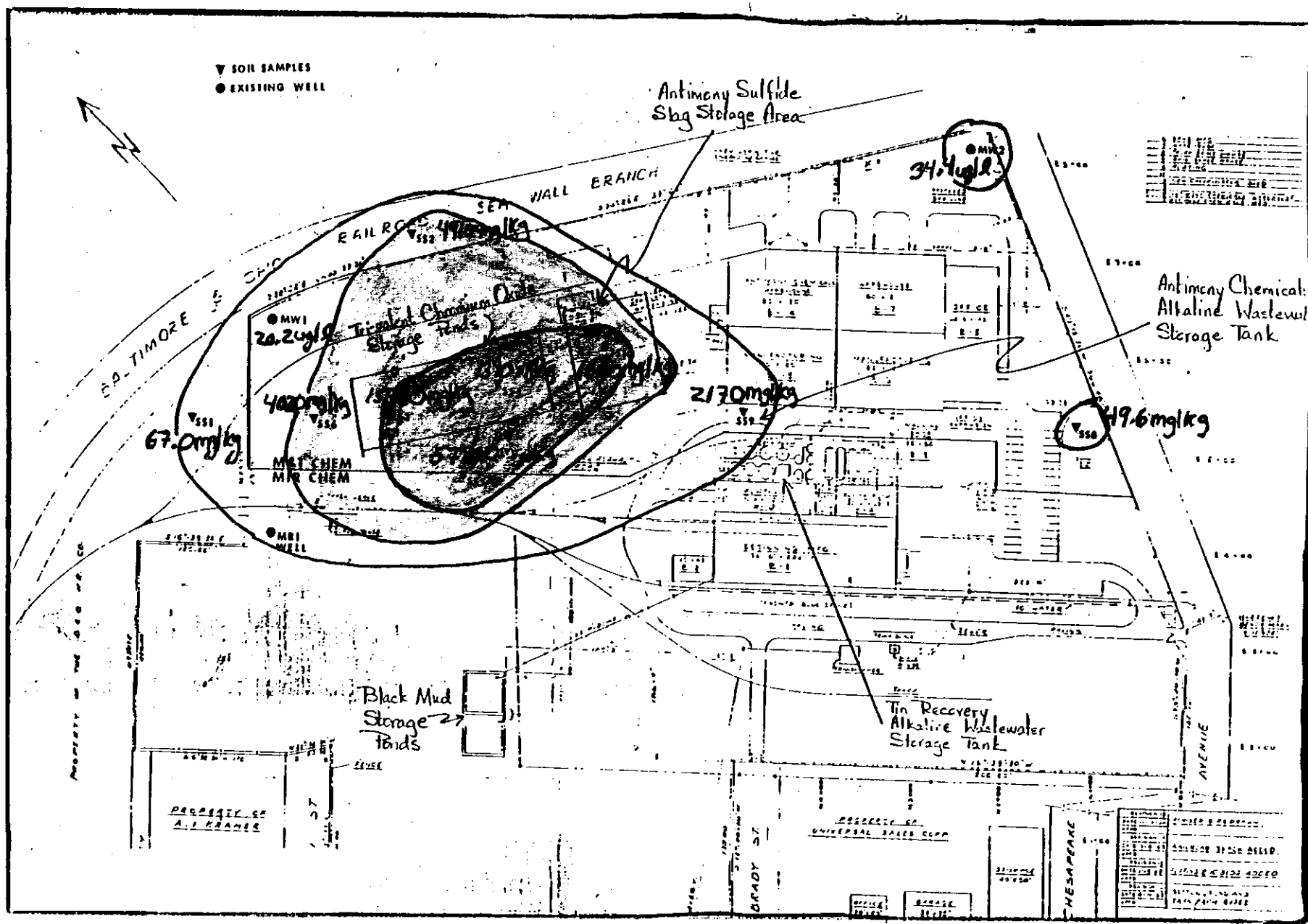


Figure 7

M&T CHEMICALS' LEAD CONTAMINATION

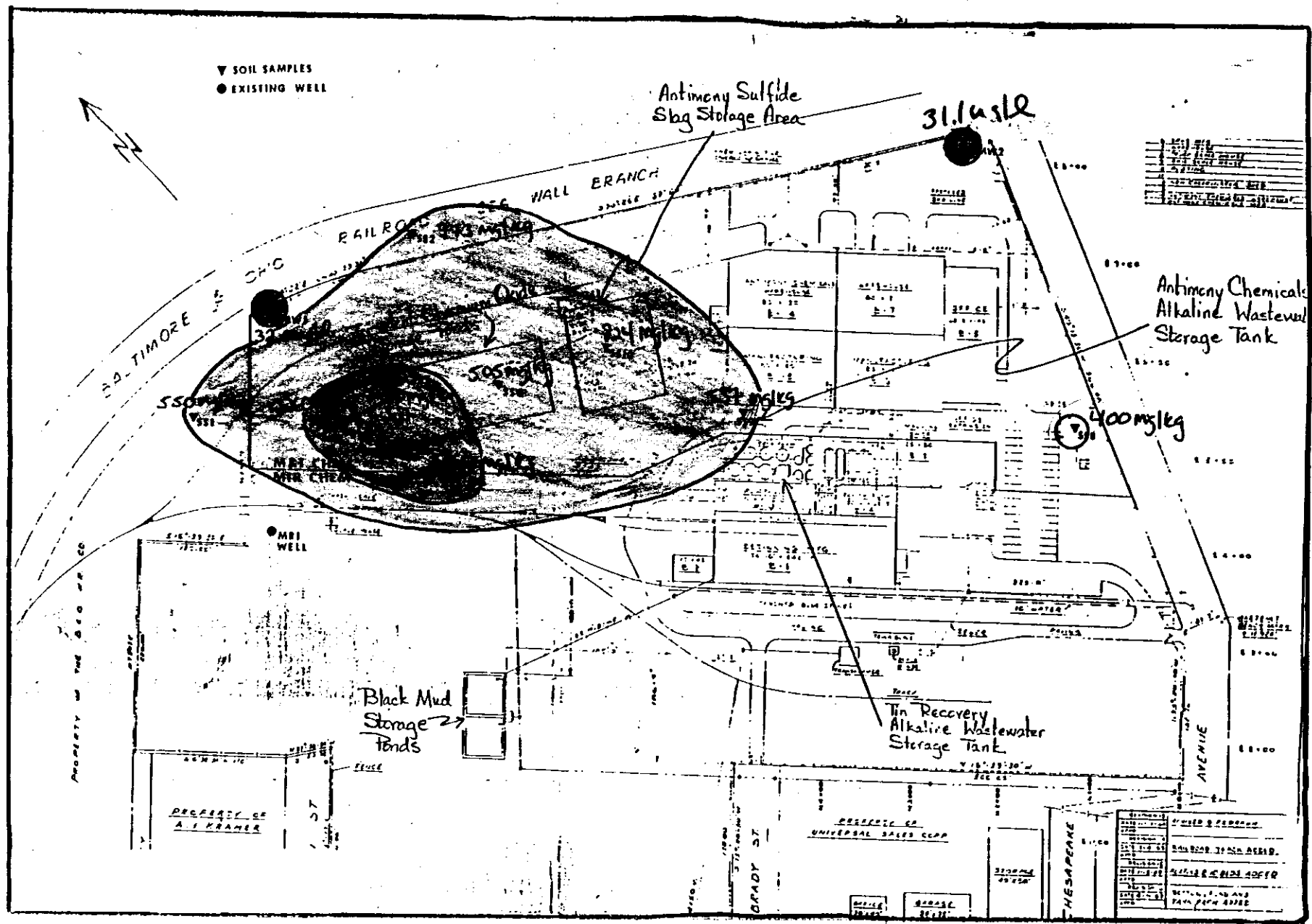


Figure 8

APPENDIX B
PHOTOGRAPHS

EPA REGION III
SUPERFUND DOCUMENT MANAGEMENT SYSTEM

DOC ID # 434479
PAGE # _____

IMAGERY COVER SHEET
UNSCANNABLE ITEM

Contact the CERCLA Records Center to view this document.

SITE NAME	<u>MAT CHEM INC</u>
OPERABLE UNIT	<u>00</u>
SECTION/BOX/FOLDER	<u>1C BOX 1 1.002</u>

REPORT OR DOCUMENT TITLE	<u>Site inspection final report - Vol 1</u>
DATE OF DOCUMENT	<u>Aug 1, 89</u>
DESCRIPTION OF IMAGERY	<u>site photos</u>
NUMBER AND TYPE OF IMAGERY ITEM(S)	<u>site photos</u>

10/10/10

APPENDIX C
SUMMARY TABLES

GROUNDWATER CONTAMINANTS
(ug/l)

TABLE 1

SUBSTANCE	MW-1	MW-2	MW-3	MW-4	*DRINKING WATER
INORGANIC		DUPLICATE	DUPLICATE	FB	STANDARD/ADVISORY
TOTAL METALS					
ARSENIC					50 (MCL)
CADMIUM	6.9(B)	9.6(B)	5.7(B)	8.2(J)	5 (PMCLG)
CHROMIUM	20.2	34.4	31.7		100 (PMCLG)
LEAD	32.0(J)	31.1(J)	20.6(J)	2.8(J)	5 (PMCLG)
MERCURY				1.0	2 (MCL)

DISSOLVED METALS

ARSENIC					50 (MCL)
CADMIUM	7.9(B)	11.5(B)		5.6(B)	5 (PMCLG)
CHROMIUM		8.9	10.7		100 (PMCLG)
LEAD					5 (PMCLG)
MERCURY	0.50(B)		1.8(B)	0.40(B)	2 (MCL)

ORGANICS

METHYLENE					
CHLORIDE	4.0(B)	35.0(B)	6.0(B)	22.0(B)	NA
1,1,1-TRI- CHLOROETHANE					
(TCA)				4.0(J)	200 (MCL)
TRI- CHLOROETHENE					
(TCE)				18.0	5 (MCL)

* US EPA Office of Drinking Water. Drinking Water Standards and Health Advisories, 1988.

MCL- Maximum Contaminant Level

PMCL- Proposed Maximum Contaminant Level

PMCLG- Proposed Maximum Contaminant Level Goal

NA- No Information Available

FB- Field Blank

B- Analyte not found substantially above the laboratory or field blank.

J- Analyte found, reported value may not be accurate or precise.

SOIL CONTAMINANTSTABLE 2(mg/kg)

<u>SUBSTANCE</u>	<u>SS-1</u>	<u>SS-2</u>	<u>SS-3</u>	<u>SS-4</u>	<u>SS-11</u>	<u>SS-6</u>
------------------	-------------	-------------	-------------	-------------	--------------	-------------

INORGANIC

<u>ARSENIC</u>	20.9 (J)	34.5 (J)	6.7 (J)	12.1 (J)	4.2 (J)	8.1 (J)
<u>CADMIUM</u>	7.3 (J)	14.0 (J)	35.5 (J)	9.2 (J)	39.2 (J)	23.3 (J)
<u>CHROMIUM</u>	67.0 (J)	4910 (J)	15400 (J)	1390 (J)	890 (J)	4020 (J)
<u>LEAD</u>	550 (J)	973 (J)	1400 (J)	505 (J)	2500 (J)	3260 (J)
<u>MERCURY</u>	0.29 (J)	0.14 (J)	0.24 (J)	1.1 (J)	1.8 (J)	1.5 (J)

ORGANICMETHYLENE

<u>CHLORIDE</u>	48 (B)	44 (B)
<u>PAH'S</u>	58-	210-
	320 (J)	3900

BIS (2-ETHYLHEXL)

<u>PHTHALATE</u>	790	210
------------------	-----	-----

SOIL CONTAMINANTS (CONTINUED)

<u>SUBSTANCE</u>	<u>SS-5</u>	<u>SS-8</u>	<u>SS-9</u>	<u>SS-10</u>
------------------	-------------	-------------	-------------	--------------

INORGANIC

<u>ARSENIC</u>	7.6 (J)	11.7 (J)	6.9 (J)	9.9 (J)
<u>CADMIUM</u>	29.9 (J)	6.1 (J)	2.6 (J)	11.7 (J)
<u>CHROMIUM</u>	57800 (J)	49.6 (J)	2170 (J)	1600 (J)
<u>LEAD</u>	2060 (J)	400 (J)	537 (J)	824 (J)
<u>MERCURY</u>	0.90 (J)	0.55 (J)	0.64 (J)	0.49 (J)

APPENDIX E
CLP DATA VALIDATION

ORGANIC



2568A RIVA ROAD
SUITE 300
ANNAPOLIS, MD 21401
PHONE: 301-266-9887

DATE: February 9, 1989

SUBJECT: Organic Data Validation for Case 10887
Site: M&T Chemicals

FROM: (b) (4)

TO:

THROUGH:

Overview

Case 10887 consisted of four (4) water samples and two (2) soil samples taken from the M&T Chemicals site on November 17, 1988. The four (4) water samples, which include one (1) blank, one (1) spiked sample and one (1) field duplicate pair, and the two (2) soil samples, which include one (1) field duplicate pair, were analyzed for volatile organics, semi-volatile organics and pesticides/PCBs. The laboratory analyzed all samples according to the Contract Laboratory Program (CLP) Routine Analytical Services (RAS).

Summary

All samples, except for sample CQ848, were successfully analyzed for all target compounds with the exception of 2-butanone. All instrument and method sensitivities were according to the Contract Laboratory Program (CLP) Routine Analytical Services (RAS) protocol.

Major Problems

- o Sample CQ848 had two surrogate recovery limits below 10% for the acid surrogates. The sample was reextracted, but the results were similar to the initial recovery, with three recovery limits below 10%. Quantitation limits for the affected compounds were qualified "R" for unreliable. (See Data Summary Form in Appendix B and Form II SV-1 in Appendix F).
- o The response factor for 2-butanone was less than 0.050 in continuing calibration standards for samples CQ846, CQ848, and CQ849. Quantitation limits for the affected samples were qualified "R" for unreliable. (See Table I and Forms VI and VII in Appendix F).



Minor Problems

- o Several volatile organic compounds failed precision criteria for the initial and continuing calibration standards. The quantitation limits are qualified "UJ" for those samples affected. (See Table I and Forms VI and VII in Appendix F).

NOTES

- o The maximum concentrations of all compounds found in the method and/or trip blanks are listed below. All samples with concentrations of common laboratory contaminants that are less than ten times (<10x) the blank level and for uncommon contaminants that were less than five times (<5x) the blank level have been qualified "B" on data summary forms. (See Data Summary Form in Appendix B).

<u>Compound</u>	<u>Concentration</u>
methylene chloride*	23 ug/L
acetone*	6 ug/L
trichloroethene	18 ug/L

* = common contaminants

- o The field duplicate pair for water did not yield data that was usable for precision accuracy. For soils, the field duplicate did yield data that was usable (See Table II in Appendix F).

All data for Case 10887 was reviewed in accordance with the Functional Guidelines for Evaluating Organic Analyses with Modifications for Use Within Region III. This report addresses only those affected problems.

Attachments

- 1) Appendix A - Glossary of Data Qualifier Codes
- 2) Appendix B - Data Summary. These include:
 - (a) All positive results for target compounds with qualifier flags where applicable;
 - (b) All unusable detection limits (qualified "R").
- 3) Appendix C - Results as Reported by the Laboratory for all Target Compounds.
- 4) Appendix D - Reviewed and Corrected Tentatively Identified Compounds
- 5) Appendix E - DPO Report for Contractual Compliance
- 6) Appendix F - Support Documentation



Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.



Appendix B

Data Summary Forms

DATA SUMMARY FORM: VOLATILES 1

Site Name: M&T ChemicalsWATER SAMPLES
(ug/L)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CROL * Dilution Factor)

CROL	COMPOUND	Sample No. Dilution Factor Location		CQ846		CQ847		CQ848		CQ849							
		1.0		1.0		1.0		1.0		1.0							
		MW-1 Spike		MW-2		MW-3 Duplicate CQ847		MW-4 Blank									
10	Chloromethane																
10	Bromomethane							UJ									
10	*Vinyl Chloride																
10	Chloroethane																
5	*Methylene Chloride	4	B	35	B	6	B	22	B								
10	Acetone	5	B			2	B	6	B								
5	Carbon Disulfide																
5	*1,1-Dichloroethene																
5	1,1-Dichloroethane																
5	*Total-1,2-Dichloroethene																
5	Chloroform																
5	*1,2-Dichloroethane																
10	*2-Butanone		R				R										
5	*1,1,1-Trichloroethane							4	J								
5	*Carbon Tetrachloride																
10	Vinyl Acetate																
5	Bromodichloromethane																

CROL = Contract Required Quantitation Limit

* Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: M & T ChemicalsWATER SAMPLES
(ug/L)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	Sample No. Dilution Factor Location COMPOUND	CQ846 1.0 MW-1 Spike	CQ847 1.0 MW-2	CQ848 1.0 MW-3 Duplicate CQ847	CQ849 1.0 MW-4 Blank													
5	*1,2-Dichloropropane																	
5	Cis-1,3-Dichloropropene																	
5	Trichloroethene				18													
5	Dibromochloromethane																	
5	1,1,2-Trichloroethane																	
5	*Benzene																	
5	Trans-1,3-Dichloropropene																	
5	Bromoform																	
10	4-Methyl-2-pentanone	UJ	UJ	UJ	UJ													
10	2-Hexanone	UJ	UJ	UJ	UJ													
5	*Tetrachloroethene																	
5	1,1,2,2-Tetrachloroethane																	
5	*Toluene																	
5	*Chlorobenzene																	
5	*Ethylbenzene																	
5	*Styrene																	
5	*Total Xylenes																	

CRQL = Contract Required Quantitation Limit

* Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: B N A S 1

Site Name: M&T ChemicalsWATER SAMPLES
(ug/L)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CRQL * Dilution Factor)

Sample No. Dilution Factor Location		CQ846		CQ847		CQ848		CQ849											
		1.0		1.0		1.0		1.0											
		MW-1 Spike		MW-2		MW-3 Duplicate CQ847		MW-4 Blank											
CRQL	COMPOUND																		
10	Phenol						R												
10	bis(2-Chloroethyl)ether																		
10	2-Chlorophenol						R												
10	*1,3-Dichlorobenzene																		
10	*1,4-Dichlorobenzene																		
10	Benzyl Alcohol																		
10	1,2-Dichlorobenzene																		
10	2-Methylphenol						R												
10	bis(2-Chloroisopropyl)ether																		
10	4-Methylphenol						R												
10	N-Nitroso-di-n-propylamine																		
10	Hexachloroethane																		
10	Nitrobenzene																		
10	Isophorone																		
10	2-Nitrophenol						R												
10	2,4-Dimethylphenol						R												
50	Benzoic Acid						R												
10	bis(2-Chloroethoxy)methane																		
10	2,4-Dichlorophenol						R												
10	1,2,4-Trichlorobenzene																		
10	Naphthalene																		
10	4-Chloroaniline																		

CRQL = Contract Required Quantitation Limit

* Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: B N A S

2

Site Name: M&T ChemicalsWATER SAMPLES
(ug/L)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRQL	COMPOUND	Sample No. Dilution Factor Location		CQ846		CQ847		CQ848		CQ849									
		1.0		1.0		1.0		1.0											
		MW-1 Spike		MW-2		MW-3 Duplicate CQ847		MW-4 Blank											
10	Hexachlorobutadiene																		
10	4-Chloro-3-methylphenol							R											
10	2-Methylnaphthalene																		
10	Hexachlorocyclopentadiene																		
10	2,4,6-Trichlorophenol							R											
50	2,4,5-Trichlorophenol							R											
10	2-Chloronaphthalene																		
50	2-Nitroaniline																		
10	Dimethyl phthalate																		
10	Acenaphthylene																		
10	2,6-Dinitrotoluene																		
50	3-Nitroaniline																		
10	Acenaphthene																		
50	2,4-Dinitrophenol							R											
50	4-Nitrophenol							R											
10	Dibenzofuran																		
10	2,4-Dinitrotoluene																		
10	Diethylphthalate																		
10	4-Chlorophenyl phenylether																		
10	Fluorene																		
50	4-Nitroaniline																		
50	4,6-Dinitro-2-methylphenol							R											

CRQL = Contract Required Quantitation Limit

* Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: B N A S 3

Site Name: M&T ChemicalWATER SAMPLES
(ug/L)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CRQL * Dilution Factor)

CRDL	COMPOUND	Sample No. Dilution Factor Location	CQ846	CQ847	CQ848	CQ849												
			1.0	1.0	1.0	1.0												
		MW-1 Spike		MW-2	MW-3 Duplicate CQ847	MW-4 Blank												
10	N-Nitrosodiphenylamine																	
10	4-Bromophenyl-phenylether																	
10	*Hexachlorobenzene																	
50	*Pentachlorophenol					R												
10	Phenanthrene																	
10	Anthracene																	
10	Di-n-butylphthalate																	
10	Fluoranthene																	
10	Pyrene																	
10	Butylbenzylphthalate																	
20	3,3-Dichlorobenzidine																	
10	Benzo(a)anthracene																	
10	Chrysene																	
10	bis(2-Ethylhexyl)phthalate																	
10	Di-n-octyl phthalate																	
10	Benzo(b)fluoranthene																	
10	Benzo(k)fluoranthene																	
10	Benzo(a)pyrene																	
10	Indeno(1,2,3-cd)pyrene																	
10	Dibenz(a,h)anthracene																	
10	Benzo(g,h,i)perylene																	

CRQL = Contract Required Quantitation Limit

* Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: P E S T I C I D E S A N D P C B S

Site Name: M & T ChemicalsWATER SAMPLES
(ug/L)Case #: 10887 Sampling Date: 11/17/08To calculate sample quantitation limit:
(CRQL * Dilution Factor)

Sample No. Dilution Factor Location	COMPOUND	CQ 846		CQ 847		CQ 848		CQ 849									
		1.0		1.0		1.0		1.0									
		MW-1 Spike		MW-2		MW-3 Duplicate CQ 847		MW-4 Blank									
CRQL																	
0.05	alpha-BHC																
0.05	beta-BHC																
0.05	delta-BHC																
0.05	*Gamma-BHC (Lindane)																
0.05	*Heptachlor																
0.05	Aldrin																
0.05	Heptachlor Epoxide																
0.05	Endosulfan I																
0.10	Dieldrin																
0.10	4,4'-DDE																
0.10	*Endrin																
0.10	Endosulfan II																
0.10	4,4'-DDD																
0.10	Endosulfan Sulfate																
0.10	4,4'-DDT																
0.5	*Methoxychlor																
0.10	Endrin ketone																
0.5	*Alpha-Chlordane																
0.5	*Gamma-Chlordane																
1.0	*Toxaphene																
0.5	*Aroclor-1016																
0.5	*Aroclor-1221																
0.5	*Aroclor-1232																
0.5	*Aroclor-1242																
0.5	*Aroclor-1248																
1.0	*Aroclor-1254																
1.0	*Aroclor-1260																

CRQL = Contract Required Quantitation Limit

* Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: V O L A T I L E S 1

Site Name: M&T Chemicals

SOIL SAMPLES
(ug/Kg)

Case #: 10387 Sampling Date: 11/17/88

To calculate sample quantitation limit:
 $(\text{CRQL} \times \text{Dilution Factor}) / ((100 - \% \text{ moisture})/100)$

[illegible]

CNQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: V O L A T I L E S 2

Site Name: M&T ChemicalsSOIL SAMPLES
(ug/Kg)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100-% moisture)/100)

CRQL	COMPOUND	Sample No.	CQ854	CQ855														
		Dilution Factor	1.00	1.00														
		% Moisture	11	15														
		Location	SS-11 Duplicate	SS-4														
5	1,2-Dichloropropane																	
5	Cis-1,3-Dichloropropene																	
5	Trichloroethene																	
5	Dibromochloromethane																	
5	1,1,2-Trichloroethane																	
5	Benzene																	
5	Trans-1,3-Dichloropropene																	
5	Bromoforn																	
10	4-Methyl-2-pentanone																	
10	2-Hexanone																	
5	Tetrachloroethene																	
5	1,1,2,2-Tetrachloroethane																	
5	Toluene																	
5	Chlorobenzene																	
5	Ethylbenzene																	
5	Styrene																	
5	Total Xylenes																	

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: B N A S

1

Site Name: MAT ChemicalsSOIL SAMPLES
(ug/Kg)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CRL * Dilution Factor) / ((100-% moisture)/100)

Sample No. Dilution Factor % Moisture Location	CQ854		CQ855														
	1.0		1.0														
	11		15														
	SS-11 Duplicate		SS-4														
COMPOUND																	
Phenol																	
bis(2-Chloroethyl)ether																	
2-Chlorophenol																	
1,3-Dichlorobenzene																	
1,4-Dichlorobenzene																	
Benzyl Alcohol																	
1,2-Dichlorobenzene																	
2-Methylphenol																	
bis(2-Chloroisopropyl)ether																	
4-Methylphenol																	
N-Nitroso-di-n-propylamine																	
Hexachloroethane																	
Nitrobenzene																	
Isophorone																	
2-Nitrophenol																	
2,4-Dimethylphenol																	
Benzoic Acid																	
bis(2-Chloroethoxy)methane																	
2,4-Dichlorophenol																	
1,2,4-Trichlorobenzene																	
Naphthalene																	
4-Chloroaniline																	

CRL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

DATA SUMMARY FORM: B N A S

2

Site Name: M & T ChemicalsSOIL SAMPLES
(ug/Kg)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100-% moisture)/100)

Sample No. Dilution Factor % Moisture Location		CQ854		CQ855													
		1.00		1.0													
		11		15													
		SS-11 Duplicate		SS-4													
10L	COMPOUND																
330	Hexachlorobutadiene																
330	4-Chloro-3-methylphenol																
330	2-Methylnaphthalene																
330	Hexachlorocyclopentadiene																
330	2,4,6-Trichlorophenol																
1600	2,4,5-Trichlorophenol																
330	2-Chloronaphthalene																
1600	2-Nitroaniline																
330	Dimethyl_phthalate																
330	Acenaphthylene																
330	2,6-Dinitrotoluene																
1600	3-Nitroaniline																
330	Acenaphthene			220	J												
1600	2,4-Dinitrophenol																
1600	4-Nitrophenol																
330	Dibenzofuran																
330	2,4-Dinitrotoluene																
330	Diethylphthalate																
330	4-Chlorophenyl phenylether																
330	Fluorene																
1600	4-Nitroaniline																
1600	4,6-Dinitro-2-methylphenol																

DATA SUMMARY FORM: B N A S

3

Site Name: M & T ChemicalsSOIL SAMPLES
(ug/Kg)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CROL * Dilution Factor) / ((100-% moisture)/100)

Sample No. Dilution Factor % Moisture Location		CQBS4		CQBS5															
		1.0		1.0															
		11		15															
		SS-11 Duplicate		SS-4															
DL	COMPOUND																		
30	N-Nitrosodiphenylamine																		
30	4-Bromophenyl phenylether																		
30	Hexachlorobenzene																		
600	Pentachlorophenol																		
30	Phenanthrene	220	J	3500															
30	Anthracene	58	J	790															
30	Di-n-butylphthalate																		
30	Fluoranthene	350	J	3900															
30	Pyrene	410	J	3800															
30	Butylbenzylphthalate																		
600	3,3-Dichlorobenzidine																		
30	Benzo(a)anthracene	260	J	2400															
30	Chrysene	270	J	2100															
30	bis(2-Ethylhexyl)phthalate	790		310	J														
30	Di-n-octyl phthalate																		
30	Benzo(b)fluoranthene	270	J	2100															
30	Benzo(k)fluoranthene	250	J	1300															
30	Benzo(a)pyrene	310	J	2100															
30	Indeno(1,2,3-cd)pyrene	330	J	1700															
30	Dibenz(a,h)anthracene	160	J	370	J														
30	Benzo(g,h,i)perylene	180	J	950															

DATA SUMMARY FORM: P E S T I C I D E S A N D P C B S

Site Name: M & T ChemicalsSOIL SAMPLES
(ug/Kg)Case #: 10887 Sampling Date: 11/17/88To calculate sample quantitation limit:
(CRQL * Dilution Factor) / ((100-% moisture)/100)

Sample No. Dilution Factor % Moisture Location		CQ 854		CQ 855													
		2.0		2.0													
		11		11													
		SS-11 Duplicate		SS-4													
VOL	COMPOUND																
8	alpha-BHC																
8	beta-BHC																
8	delta-BHC																
8	Gamma-BHC (Lindane)																
8	Heptachlor																
8	Aldrin																
8	Heptachlor Epoxide																
8	Endosulfan I																
16	Dieldrin																
16	4,4'-DDE																
16	Endrin																
16	Endosulfan II																
16	4,4'-DDD																
16	Endosulfan Sulfate																
16	4,4'-DDT																
80	Methoxychlor																
16	Endrin ketone																
80	Alpha-Chlordane																
80	Gamma-Chlordane																
160	Toxaphene																
80	Aroclor-1016																
80	Aroclor-1221																
80	Aroclor-1232																
80	Aroclor-1242																
80	Aroclor-1248																
160	Aroclor-1254																
160	Aroclor-1260																

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

10-10-10

INORGANIC



2568A RIVA ROAD
SUITE 300
ANNAPOLIS, MD 21401
PHONE: 301-266-9887

DATE: February 21, 1989
SUBJECT: INORGANIC DATA VALIDATION, CASE 10887
SITE: M & T CHEMICAL

FROM: (b) (4) *MM*

TO:

THRU:

(b) (4)

OVERVIEW

The set of samples for Case 10887 contained five (5) unfiltered aqueous, four (4) filtered aqueous and ten (10) soil samples, which were analyzed through the Contract Laboratory Program (CLP) Routine Analytical Services. The sample set contained one (1) each of the following: aqueous field blank, filtered aqueous field blank, unfiltered aqueous field duplicate, filtered aqueous field duplicate and soil field duplicate pair.

The action levels (10-day health advisory limits) were exceeded for the Cd and Pb analyte in several samples. (See Table 3).

SUMMARY

All analytes were successfully analyzed in all samples.

Qualifiers were not applied to the results of the samples which had already been qualified "B", denoting blank contamination, in the data summary (Table 5).

Areas of concern with respect to data usability are listed according to the seriousness of the problem. These include:

MINOR ISSUES

Several blanks had reported results that were > IDL. The reported results for the analytes in the affected samples which are < 5X the blank concentration may be biased high and, therefore, have been qualified "B" as summarized in the following table:

<u>ANALYTE</u>	<u>SAMPLE TYPE</u>	<u>TYPE OF BLANK</u>
Al, Sb, Cd, Cu, Fe, Pb, Mn, Hg, Zn	aqueous	field
As Ag	filtered aqueous soil	filtered field preparation

Several duplicate results were outside of the control limits in the analyses. Therefore, the quantitation limit and reported results for the analytes have been qualified estimated "UJ" and "J" respectively, as summarized in the following table:

<u>ANALYTE</u>	<u>SAMPLE TYPE</u>	<u>TYPE OF DUPLICATE</u>	<u>CONTROL LIMIT</u>
Cu, Fe, Pb	unfiltered aqueous	field	\pm CRDL or RPD >20%
Cd, Pb	unfiltered aqueous	laboratory	\pm CRDL
Cd, Fe, Hg	filtered aqueous	field	\pm CRDL
Cd	filtered aqueous	laboratory	\pm CRDL
As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Ag, Zn	soil	field	\pm 2XCRDL or RPD >35%

The percent differences (%D) of the serial dilution were greater than the 10% limit for the Al, Sb, Ca, Cr, Fe, Pb, Mn, and Zn analytes in the soil samples. Therefore, the reported results for these analytes in the soil samples have been qualified estimated, "J".

Due to the low pH values (<12) the unfiltered aqueous quantitation limits for the CN⁻ analyte may be biased low and, therefore, have been qualified "UL".

Several matrix spike recoveries were extremely low (<30%) or low (30-74%) in the analyses. The quantitation limits and reported results may be biased and have been qualified accordingly for the analytes as summarized in the following table:

<u>ANALYTE</u>	<u>SAMPLE TYPE</u>	<u>RECOVERY</u>	<u>REPORTED RESULT</u>	<u>QUANTITATION LIMIT</u>
Al	unfiltered aqueous	extremely low	L	-
Sb	unfiltered aqueous	low	L	-
Pb	unfiltered aqueous	low	L*	-
Se	filtered aqueous	low	-	UL
Se	soil	low	-	UL

* = The qualifier "J" denoting estimated values supersedes the qualifier "L" issued in this table.

Several aqueous and soil samples had low analytical spike recoveries for the Pb, and Se analytes. The quantitation limits for these analytes may be biased low in the affected samples and, therefore, have been qualified "UL".

NOTE

Several samples had elevated detection limits due to the dilution of the samples. (See table 4)

The data was reviewed according to the National Functional Guidelines for Evaluating Inorganic Analyses.

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers added to the laboratory's results during evaluation.



ATTACHMENTS

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN
TABLE 2	GLOSSARY OF DATA QUALIFIER CODES
TABLE 3	SUMMARY OF SAMPLES WITH EXCEEDED ACTION LEVEL ANALYTES
TABLE 4	SUMMARY OF SAMPLES REQUIRING DILUTIONS
TABLE 5	DATA SUMMARY FORM
APPENDIX A	RESULTS REPORTED BY LABORATORY FORM I
APPENDIX B	DPO REPORT
APPENDIX C	SUPPORT DOCUMENTS



TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY
AFTER DATA VALIDATION

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Al	MCAD56; MCX996	B		High	A (285 ppb)
	MCX993; MCX995; MCX997; MCX999	L		Extremely Low	B (9.1%)
	All soil samples	J			C (12.8%)
Sb	MCAD56; MCX999	L		Low	D (58%)
	MCX993; MCX995; MCX997	B		High	A (293 ppb) D (58%)
	MCX996; MCX998	B		High	A (293 ppb)
	All soil samples	J			C (15%)
As	MCX994; MCX996; MCX998	B		High	E (3.0 ppb)
	All soil samples	J			F (± 4.0 ppm)
Ba	All soil samples	J			F (60%)
Cd	MCAD56; MCX999	J	UJ		G (± 5.0 ppb)
	MCX993; MCX995; MCX997	B		High	A (8.2 ppb) G (± 5.0 ppb)
	MCX994; MCX996; MCY498	B		High	A (8.2 ppb) F (± 5.0 ppb) G (± 5.0 ppb)
	MCX998		UJ		F (± 5.0 ppb) G (± 5.0 ppb)
	All soils samples	J			F (124%)

* See explanation of comments in table 1 B



TABLE 1A CONT.

SUMMARY OF QUALIFIERS ON DATA SUMMARY
AFTER DATA VALIDATION

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Ca	All soil samples	J			C (161%)
Cr	All soil samples	J			C (12.8%) F (44%)
Cu	MCAD56; MCX993; MCX995; MCX997	B		High	A (86.2 ppb) F (± 25 ppb)
	MCX999	J			F (± 25 ppb)
	All soil samples	J			F (82%)
Fe	MCAD56	B		High	A (451 ppb) F (20.8%)
	MCX993; MCX995; MCX997; MCX999	J			F (20.8%)
	MCX994; MCX996	B		High	A (451 ppb) F (± 100 ppb)
	MCX998; MCY498		UJ		F (± 100 ppb)
	All soil samples	J			C (13%) F (74%)
Pb	MCAD56	B		High	A (2.8 ppb) D (69%) F (± 5.0 ppb) G (± 5.0 ppb) H (145%)
	MCX993; MCX995; MCX997	J			F (± 5.0 ppb) G (± 5.0 ppb) D (69%)

* See explanation of comments in table 1 B



TABLE 1A CONT.

SUMMARY OF QUALIFIERS ON DATA SUMMARY
AFTER DATA VALIDATION

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Pb(cont.)	MCX999	J			F (± 5.0 ppb) G (± 5.0 ppb) D (69%) H (133%)
	MCX994; MCX996; MCX998		UL	Low	I (45-75%)
	All soil samples	J			C (18.7%) F (133%)
Mn	MCAD56	B		High	A (32.8 ppb)
	All soil samples	J			C (16.3%) F (64%)
Hg	MCAD56	B		High	A (1.0 ppb)
	MCX994; MCX998; MCY498	B		High	A (1.0 ppb) F (± 0.2 ppb)
	MCX996		UJ		F (± 0.2 ppb)
	All soil samples	J			F (48%)
Se	MCAD56;		UL	Low	I (71%)
	MCX994		UL	Low	D (62%) I (65%)
	MCX996; MCX998; MCY498		UL	Low	D (62%)
	MCAD10; MCAD11; MCP001		UL	Low	D (74%) I (61-77%)
	MCP002 - MCP005; MCY499; MCY500; MCY852		UL	Low	D (74%)

* See explanation of comments in Table 1 B



TABLE 1A CONT.

SUMMARY OF QUALIFIERS ON DATA SUMMARY
AFTER DATA VALIDATION

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Ag	MCAD10; MCP002; MCP004; MCY852	B		High	J (1.47 ppm) F (± 4.0 ppm)
	MCAD11; MCP001; MCP003; MCP005; MCY499; MCY500	J	UJ		F (± 4.0 ppm)
Zn	MCAD56; MCX993; MCX995; MCX996; MCX997; MCX998	B		High	A (27.1 ppb)
	All soil samples	J			C (13.5%) F (98%)
CN ⁻	All unfiltered aqueous		UL	Low	K

* See explanation of comments in Table 1 B



TABLE 1B

CODES USED IN COMMENTS COLUMN

- A = The aqueous field blank had a result > IDL (the result is in parentheses) and the reported results were < 5X the blank. The reported results may be biased high.
- B = Due to an extremely low (<30%) matrix spike recovery (% recovery in parentheses), the reported results may be biased extremely low.
- C = The percent difference (%D) of the serial dilution was > the 10% control limit. Therefore, the reported results are estimated.
- D = Due to a low matrix spike recovery (% recovery in parentheses), the quantitation limits and/or reported result may be biased low.
- E = The filtered aqueous field blank had a result > IDL (the result is in parentheses) and the reported results were <5X the blank. The reported result may be biased high.
- F = The field duplicate results were outside the control limits, \pm CRDL or RPD >20% for the aqueous and \pm 2XCRDL or RPD >35% for the soil samples (CRDL, 2XCRDL or relative percent difference in parentheses). Therefore, the quantitation limits and/or reported results are estimated.
- G = The laboratory duplicate results were outside the control limits, \pm CRDL, or RPD >20% (CRDL or relative percent difference in parentheses). Therefore, the quantitation limits and/or reported results are estimated.
- H = Due to the high analytical spike recovery (% recovery in parentheses) the reported result may be biased high.
- I = Due to the low analytical spike recovery (ies), (% recovery in parentheses) the quantitation limits or reported results may be biased low.
- J = The soil preparation blank had a result > IDL (the result is in parentheses) and the reported results were < 5X the blank. The reported results may be biased high.
- K = Due to the low pH values the quantitation limits may be biased low.



TABLE 2

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.



TABLE 3

SUMMARY OF SAMPLES WITH EXCEEDED ACTION LEVEL ANALYTES

<u>Analyte</u>	<u>Sample</u>	<u>Reported results</u>		<u>Action Levels</u>	
		<u>(ug/L)</u>	<u>(mg/Kg)</u>	<u>Aqueous</u> <u>(ug/L)</u>	<u>Soil</u> <u>(mg/Kg)</u>
Cd	MCX995	9.6		8.0	
	MCX996	11.5			
	MCX999	8.2			
Pb	MCX993	32.0		20.0	
	MCX995	31.1			
	MCX997	20.6			
	MCAD10		505		500
	MCAD11		2500		
	MCP001		550		
	MCP002		973		
	MCP003		1400		
	MCP004		3260		
	MCP005		2060		
	MCY500		537		
	MCY852		824		

WESTON

TABLE 4

SUMMARY OF SAMPLES REQUIRING DILUTIONS

<u>Analyte</u>	<u>Sample Affected</u>	Resultant Quantitation Limits	
		<u>ug/L</u>	<u>mg/Kg</u>
Se	MCY500		5.7 U
	MCY852		4.4 U

Table 5

Page 1 of 2

DATA SUMMARY FORM: I N O R G A N I C S

Site Name: M and T chemicalWATER SAMPLES
(ug/L)Case #: 10787 Sampling Date(s): 11/16-17/88*Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

Sample No. Dilution Factor Location	MCAD56	MCX993	MCX994	MCX995	MCX996	MCX997	MCX998	MCX999	MCY498	
ANALYTE	Surface	MW1	MW1 Filtered	MW2 Duplicate of MCX997	MW2 Filtered Duplicate of MCX998	MW3 Duplicate of MCX995	MW3 Filtered Duplicate of MCX996	MW4 field Blank	MW4 Filtered field Blank	
CRDL										
200	Aluminum	459 B	6100 L		2950 L	[125] B	2440 L		285 L	
60	Antimony	29100 L	307 B		218 B	140 B	178 B	[140] B	293 L	
10	*Arsenic	22.4	[8.0]	[5.0] B		[4.0] B	[3.2]	[3.5] B		[3.0]
200	Barium	[51.7]	[141]	[73.8]	[101]	[48.3]	[82.8]	[48.4]		
5	Beryllium									
5	*Cadmium	UJ	6.9 B	7.9 B	7.6 B	11.5 B	7.7 B	UJ	8.2 J	5.6 B
5000	Calcium	58800	58200	52900	139000	119000	128000	117000	5770	
10	*Chromium	45.4	20.2		344	[8.9]	31.7	10.7		
50	Cobalt		[24.5]	[14.2]	[29.8]		[25.7]	[9.0]		
25	Copper	124 B	163 B		133 B		91.4 B		86.2 J	
100	Iron	778 B	8430 J	766 B	2810 J	114 B	2280 J	UJ	451 J	UJ
5	*Lead	13.5 B	32.0 J		UL	31.1 J	UL	20.6 J	UL	[2.8] J
5000	Magnesium	8480	27300	23500	39900	38800	40600	37800	[1530]	
15	Manganese	54.7 B	1560	2600	2730	2280	2480	2260	32.8	
0.2	Mercury	0.20 B		0.50 B			UJ	1.80 B	1.0	0.40 B
40	*Nickel							[9.2]		
5000	Potassium	6000	12800	13300	12600	12800	13000	15000	[600]	
5	Selenium	UL			UL		UL	UL		UL
10	Silver									
5000	Sodium	41900	233000	233000	77100	82800	84800	82300	[3430]	
10	Thallium									
50	Vanadium		[14.1]		[13.8]		[17.6]			
20	Zinc	63.1 B	83.8 B		80.5 B	22.0 B	61.5 B	[9.8] B	27.1	
10	*Cyanide	UL	UL	Q	UL	Q	UL	Q	UL	Q

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

Table 5

Page 2 of 2

DATA SUMMARY FORM: I N O R G A N I C S

Site Name: M and T chemicalsSOIL SAMPLES
(mg/Kg)Case #: 10887 Sampling Date(s): 11/16-17/88*Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

Sample No. Dilution Factor % Solids Location		MCAD 10		MCAD 11		MCP001		MCP002		MCP003		MCP004		MCP005		MCY 499		MCY 500		MCY 832	
		1		1		1		1		1		1		1		1		1		1	
		82.6		89.0		86.4		73.0		82.4		84.8		72.0		90.8		70.0		91.2	
		SS-4		SS-11		SS-1		SS-2		SS-3		SS-6		SS-5		SS-8		SS-9		SS-10	
		Duplicate of MCAD 11		Duplicate of MCAD 10																	
CRDL	ANALYTE																				
40	Aluminum	4970	J	9180	J	4240	J	14400	J	10300	J	8490	J	10500	J	11000	J	7550	J	14300	J
12	Antimony	2420	J	2220	J	154	J	789	J	2680	J	8220	J	4090	J	339	J	7980	J	7270	J
2	Arsenic	12.1	J	4.2	J	20.9	J	34.5	J	6.7	J	8.1	J	7.6	J	11.7	J	6.9	J	9.9	J
40	Barium	925	J	1810	J	120	J	1340	J	2260	J	1670	J	4030	J	130	J	830	J	424	J
1	Beryllium	[0.54]		[0.53]				[0.59]								[0.57]					
1	Cadmium	9.20	J	39.2	J	7.3	J	14.0	J	35.5	J	23.3	J	29.9	J	6.1	J	2.6	J	11.7	J
1000	Calcium	10200	J	8590	J	4460	J	40500	J	11300	J	15100	J	10800	J	9000	J	41400	J	63300	J
2	Chromium	1390	J	890	J	167	J	4910	J	15400	J	4020	J	57800	J	49.6	J	2170	J	1600	J
10	Cobalt	11.8		11.6		[6.2]		14.1		15.4		10.6		31.3		[8.6]		41.1		13.5	
5	Copper	68.6	J	163	J	104	J	981	J	142	J	104	J	208	J	58.4	J	122	J	107	J
20	Iron	28600	J	62000	J	29000	J	40300	J	109000	J	71100	J	78600	J	23100	J	28600	J	41000	J
1	*Lead	505	J	2500	J	550	J	773	J	1400	J	3260	J	2060	J	400	J	537	J	824	J
1000	Magnesium	1520		1720		697		9330		2220		2150		2090		4080		87600		9210	
3	Manganese	286	J	665	J	243	J	1430	J	721	J	526	J	532	J	325	J	648	J	405	J
0.2	Mercury	1.1	J	1.8	J	0.29	J	0.14	J	0.24	J	1.5	J	0.90	J	0.55	J	0.64	J	0.49	J
8	Nickel	17.7		50.2		22.0		30.3		82.1		47.8		49.9		20.2		778		48.8	
1000	Potassium	1140		[697]		[486]		[1340]		[874]		[731]		[861]		[969]		3260			
1	Selenium		UL		UL		UL		UL		UL		UL		UL		UL	+	UL	+	UL
2	Silver	[2.3]	B		UJ		UJ	5.2	B	21.7	J	3.6	B	21.7	J		UJ		UJ	2.3	B
1000	Sodium	2310		3110		1390		3140		4130		2180		6200		1500		4810		2380	
2	Thallium																				
10	Vanadium	33.8		40.2		27.8		60.7		21.3		37.2				51.2		15.1		29.6	
4	Zinc	317	J	929	J	703	J	971	J	638	J	790	J	897	J	171	J	477	J	404	J
2	Cyanide		0		0		0		0		0		0		0		0		0		0

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS



2568A RIVA ROAD
SUITE 300
ANNAPOLIS, MD 21401
PHONE: 301-266-9887

DATE: June 12, 1989

SUBJECT: INORGANIC DATA VALIDATION, SAS 4226C
SITE: M (b) (4) T (b) (4)

FROM: (b) (4)

TO: (b) (4)

OVERVIEW

The set of samples for SAS 4226C contained ten (10) soil samples which were analyzed through the Contract Laboratory (CLP) Special Analytical Services. The samples were extracted according to EPA Method 1310, Extraction Procedure (EP) Toxicity Test of Test Methods for Evaluating Solid Waste, SW-846. The extracts (leachates) were analyzed for the EP Toxicity metals: As, Ba, Cd, Cr, Pb, Hg, Se and Ag, according to the CLP Inorganic Statement of Work (SOW) 7/87.

SUMMARY

All analytes were successfully analyzed in all samples. There were no areas of concern with respect to data usability.

NOTES

The SAS Request stipulated, under "Data Requirements", that the detection limits (CRQLs) of the analytes were to be reported one magnitude lower than the maximum contaminant level (MCL) as stated in Table I of Method 1310. The lab did not follow this guideline, however, the reviewer did follow the guideline in reporting the results of the case on the data summary form (Table 2).

The data was reviewed according to the National Functional Guidelines for Evaluating Inorganic Analyses.



ATTACHMENTS

TABLE 1	GLOSSARY OF DATA QUALIFIER CODES
TABLE 2	DATA SUMMARY FORMS
APPENDIX A	RESULTS REPORTED BY LABORATORY FORM I
APPENDIX B	DPO REPORT
APPENDIX C	SUPPORT DOCUMENTATION



TABLE 1

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

TABLE 2

DATA SUMMARY FORM: INORGANICSPage 1 of 2

Case Number: SAS 4226C
Site Name: M&T Chemicals
Date of Sampling: 11/16/17/88

EP TOXICITY LEACHATES
(ug/L)

SEE GLOSSARY FOR CODE DEFINITIONS

[illegible]

TABLE 2

DATA SUMMARY FORM: INORGANICS

Page 2 of 2

Case Number: SAS 4226C
Site Name: MAR Chemicals
Date of Sampling: 11/6/88

EP TOXICITY LEACHATES
(ug/L)

SEE GLOSSARY FOR CODE DEFINITIONS

[illegible]



ESAT PROJECT
SUITE 300
2568 RIVA ROAD
ANNAPOLIS, MD 21401

DATE: April 12, 1989

SUBJECT: INORGANIC DATA VALIDATION, CASE 10592
SITE: M & T CHEMICAL COMPANY

FROM: [REDACTED] (b)(4)

TO: [REDACTED]

THRU: [REDACTED]

OVERVIEW

The set of samples for Case 10592 contained four (4) soil samples, which were analyzed through the Contract Laboratory Program (CLP) Routine Analytical Services. The sample set contained one (1) field duplicate pair.

SUMMARY

All analytes were successfully analyzed in all samples. Areas of concern with respect to data usability are listed according to the seriousness of the problem. These include:

MINOR ISSUES

The percent difference (%D) of the serial dilution was greater than the 10% limit for the Ca, Cu, and Mn analytes. Therefore, the reported results for the Ca, Cu, and Mn analytes in the samples have been qualified estimated, "J".

The correlation coefficient for the calibration curves of the Tl, Se, As, and Pb analytes were <0.995. Therefore, the reported results for the Tl, Se, and As analytes in all samples, and Pb analyte in sample MCQ827 have been qualified estimated, "J".

The matrix spike recovery was high for the Sb analyte. The reported results for the Sb analyte in the samples may be biased high and, therefore, have been qualified "K".

The matrix spike recovery was low for the Ag analyte. The reported results for the Ag analyte in the samples may be biased low and, therefore, have been qualified "L".

The analytical spike recovery for the Tl analyte was low for samples MCQ816 and MCQ822. The reported results for Tl in these samples may be affected, however, they have been qualified estimated, "J", as previously mentioned.

The analytical spike recovery for the Tl analyte was high for samples MCQ823 and MCQ827. The reported results for Tl in these sample may be affected, however, they have been qualified estimated, "J", as previously mentioned.

NOTES

The data was reviewed according to the National Functional Guidelines for Evaluating Inorganic Analyses.

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers added to the laboratory's results during evaluation.

ATTACHMENTS

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN
TABLE 2	GLOSSARY OF DATA QUALIFIER CODES
TABLE 3	DATA SUMMARY FORM
APPENDIX A	RESULTS REPORTED BY LABORATORY FORM I
APPENDIX B	DPO REPORT



TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
AFTER DATA VALIDATION

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Sb	All samples	K		High	A (132%)
As	All samples	J			B (0.978)
Ca	All samples	J			C (11%)
Cu	All samples	J			C (11%)
Pb	MCQ827	J			B (0.983)
Mn	All samples	J			C (11%)
Se	All samples	J			B (0.987)
Ag	All samples	L	UL	Low	D (46%)
Tl	MCQ823, MCQ827		UJ		B (0.993)
	MCQ816, MCQ822		UJ		B (0.993) E (44-46%)

* See explanation of comments in Table 1B.



TABLE 1B

CODES USED IN COMMENTS COLUMN

- A = Due to high matrix spike recovery (% recovery in parentheses), the quantitation limits and reported results may be biased high.
- B = The Correlation Coefficient (actual value in parentheses) was <0.995, therefore, the reported results are estimated.
- C = The percent difference (%D) of the serial dilution was greater than the 10% limit (actual %D in parentheses). Therefore, the reported results are estimated.
- D = Due to low matrix spike recovery (% recovery in parentheses), the quantitation limits and reported results may be biased low.
- E = Due to low analytical spike recovery (% recovery range in parentheses), the reported results may be affected.



TABLE 2

GLOSSARY OF DATA QUALIFIER CODE (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UJ = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

TABLE 3

DATA SUMMARY FORM: I N O R G A N I C S

Page 1 of 1Site Name: M & T Chemical CompanySOIL SAMPLES
(mg/Kg)Case #: 10592 Sampling Date(s): 10/19/88*Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

CRDL	ANALYTE	Sample No. Dilution Factor % Solids Location		MCQ 816		MCQ 822		MCQ 823		MCQ 827									
				85.8		83.2		79.4		78.6									
		MW-2		MW-1 Duplicate of MCQ 827		MW-2		MW-1 Duplicate of MCQ 822											
40	Aluminum	9550		13000		11500		6840											
12	Antimony	31	K	30	K	22	K	16	K										
2	Arsenic	12	J	20	J	18	J	8.5	J										
40	Barium	[427]		318		55		87											
1	Beryllium	[0.47]		[1.1]		[0.91]													
1	Cadmium	1.4				1.8		1.5											
1000	Calcium	3980	J	2500	J	5180	J	1850	J										
2	Chromium	29		25		104		16											
10	Cobalt	[8.07]		13		[11]		[9.1]											
5	Copper	24	J	32	J	24	J	23	J										
20	Iron	15000		15400		18000		11300											
1	*Lead	54		86		80		71	J										
1000	Magnesium	2460		1880		3220		1460											
3	Manganese	177	J	115	J	196	J	172	J										
0.2	Mercury	0.17		0.60		0.38		0.76											
8	Nickel	15		14		50		[6.0]											
1000	Polassium	[884]		[1180]		1270		[785]											
1	Selenium		UJ	1.4	J		UJ		UJ										
2	Silver	11	L	9.3	L	12	L	9.5	L										
1000	Sodium	1300		1520		1450		1570											
2	Thallium		UJ		UJ		UJ		UJ										
10	Vanadium	29		27		35		18											
4	Zinc	46		51		51		21											
2	Cyanide																		

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

DATA REVIEW CHECKLIST

Case/SAS Number: 44470 TEST 1 Site Name: M-T Chemical
 Task #: 1675 Analysis Type: Inorganic
 TID #: 02 000512 Preparer: (b) (4)
 Revision #: 0 Reviewer: (b) (4)
 Date of Report: 5/10/89 Review #: 1

CRITERIA	YES	NO	COMMENTS
Is the report format according to Region III protocol?	<u>✓</u>	<u> </u>	<u> </u>
Is the report clear?	<u>✓</u>	<u> </u>	<u> </u>
Are qualifiers applied correctly?	<u> </u>	<u>✓</u>	<u>see table summary</u>
Is there consistency between narrative, data summary form(s), and DPO report?	<u> </u>	<u>✓</u>	<u> </u>
Are there transcription errors?	<u> </u>	<u>✓</u>	<u> </u>
Are there typos?	<u>✓</u>	<u> </u>	<u> </u>
General Comments: <u> </u>			

Reviewed and Approved by: (b) (4)

Date: 5/10/89

GD:bjt
 admin#4, datarevqc

Task #: 1656

DATA VALIDATION EVALUATION CHECKLIST

Case/SAS Number: 447CTask 1 Site Name: M & T Chemical
Assignment #: 0390512 Revision Number: 0 Analysis Type: Inorganic (Hex Cr)
Reviewer: [redacted] Mechanic Contractor: ESAT SCV #: 777
Information
Request date: _____ Received date: _____
Date submitted to EPA: 5/17/89
EPA DPO: Terry Simpson
EPA RSM: James Harper 3H423
cc: Charles B. Lewis
Number of hours spent on review: 5
Number of samples: 5

YES NO COMMENTS

Is according to Region III protocol

Clarity of report

Qualifiers applied correctly

Consistency between narrative, data summary form(s), and DPO report

Inter-line transcription

REFERENCE OF CONTRACTOR YES NO COMMENTS

Approval recommended for current submission

Time spent on review as reasonable

SD OVERSIGHT

DATES

AFC/DPO

MONITOR/
EVALUATOR

ESAT

Received at EPA
oversight assigned
Oversight rec'd by TM
Oversight complete
Feedback given
mailed to RSM

Attachment(s), check if applicable: cover memo

phone log

comments

Task #: 1656

ES&E DATA VALIDATION EVALUATION CHECKLIST

Case/S&S Number: 4447C Task 1 Site Name: M & T Chemical
ID #: 03890512 Analysis Type: Enorg. (Hex Cr)

Technical Quality _____

- | | | |
|-----------------|------------------------|---------------------|
| (1) WEO _____ | INFO. REQ. DATE _____ | REASONABLE |
| WHY _____ | INFO. REC'D DATE _____ | REQUEST (Y/N) _____ |
| phone log _____ | | |
| 2) WEO _____ | INFO. REQ. DATE _____ | REASONABLE |
| WHY _____ | INFO. REC'D DATE _____ | REQUEST (Y/N) _____ |
| phone log _____ | | |
| 3) WEO _____ | INFO. REQ. DATE _____ | REASONABLE |
| WHY _____ | INFO. REC'D DATE _____ | REQUEST (Y/N) _____ |
| phone log _____ | | |
| 4) WEO _____ | INFO. REQ. DATE _____ | REASONABLE |
| WHY _____ | INFO. REC'D DATE _____ | REQUEST (Y/N) _____ |
| phone log _____ | | |

TASK MONITOR
SIGNATURE _____ DATE _____

TOTAL INFO. DELAY DAYS _____

TOTAL OVERSIGHT DELAY DAYS _____

LATE _____

ACTUAL t.a.t. _____

Compliance with Schedule _____

Estimated
hours for
review: _____

Actual hours
spent on
review: _____

Compliance with Budget _____

Management
(optional) _____

OPTIONAL COMMENTS RELATING TO SCORES:

SECTION CHIEF
SIGNATURE _____ DATE _____



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III
CENTRAL REGIONAL LABORATORY
839 BELTSVILLE ROAD
ANNAPOLIS, MARYLAND 21401
(201) 261-1180

DATE :

SUBJECT: Region III CLP Data QA Review

FROM : Patricia J. Krantz (3ES23)
Chief, Quality Assurance, Region III

TO : Carla Dempsey (OS-230)
CAO, ACB

Attached is a Region III CLP Data Review done by Weston reviewers under the ESAT contract:

Case No.: SAS 4447C Task 1
Site name: M & T Chemical
Laboratory: Allied
Reviewer: (b) (4)

Attachment

cc: EPA Site RPM
Gareth Pearson, EMSL-LV
Regional DPO: B. J. Verrett Region VI



ESAT PROJECT
2568A RIVA RD., SUITE 300
ANNAPOLIS, MD 21401
PHONE: (301) 266-9887

DATE: May 19, 1989
SUBJECT: INORGANIC DATA VALIDATION, SAS 4447C-Task 1
SITE: M&T Chemical

FROM: (b) (4)

TO:

THRU:

OVERVIEW

The set of samples for SAS 4447C-Task 1 contained five (5) air filter samples, which were analyzed for hexavalent chromium through the Contract Laboratory Program (CLP) Special Analytical Services (SAS). The method used is defined in Method 7600 of NIOSH Manual of Analytical Methods, 2nd edition. The sample set contained one (1) each of the following: field blank, blank to be spiked, backup sample and field duplicate pair.

SUMMARY

Hexavalent chromium were successfully analyzed in all samples. The reported results were verified during data validation. One concern with respect to data usability is stated below:

MINOR ISSUE

The holding time was exceeded for the hexavalent chromium. The quantitation limits may be biased low in the samples and, therefore, have been qualified "UL".

NOTE

The quantitation limits reported for samples 4447C Task 1-4 and 4447C Task 1-5 are in ug/Filter instead of ug/L. These samples were blanks and did not have flow rates reported for them to the laboratory in order to be calculated in ug/L.



Sample 4447C Task 1-4 was spiked (as per SAS request) with 1.0 ug/L of hexavalent chromium before being analyzed. The reported result on the Form I for this sample is the spike result. The reviewer did not report this value on the Data Summary Form (Table 3).

The data was reviewed according to the National Functional Guidelines for Evaluating Inorganic Analyses.

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers added to the laboratory's results during evaluation.

ATTACHMENTS

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN
TABLE 2	GLOSSARY OF DATA QUALIFIER CODES
TABLE 3	DATA SUMMARY FORMS
APPENDIX A	RESULTS REPORTED BY LABORATORY FORM I
APPENDIX B	DPO REPORT
APPENDIX C	SUPPORT DOCUMENTATION

WESTON

TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY
AFTER DATA VALIDATION

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Cr+6	All samples		UL	Low	A

* See explanation of comments in table 1B.

WESTON

TABLE 1B

CODES USED IN COMMENTS COLUMN

A = The holding time was exceeded. Therefore, the quantitation limits may be biased low.



TABLE 2

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Site Name: M and T chemicals

AIR FILTER
(ug/L)

Case #: SAS4447C Took! Sampling Date: 2/28/89

4447C Task 1**

[illegible]

* Unit = $\mu\text{g}/\text{FILTER}$

SEE NARRATIVE FOR CODE DEFINITIONS

+ { 0.0002 ug/l
0.2 ug/l filter

**** Prefix of All Samples**